# THE MARINE RECORD.

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## Lake Carriers' Association.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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## WISCONSIN'S NEW TAX LAW.

Governor Upham, of Wisconsin, has affixed his signature to the bill changing the system of taxation of vessel property. Hereafter the valuation will be uniform at all ports within the boundaries of the state. Under the provisions of the law all vessels of the age of five years and under, must be taxed on a valuation of $8 per net ton of her registered tonnage; all vessels over five years and under ten years old, on a valuation of $6 for each net ton of her tonnage, and all vessels over ten years old, on a valuation of $5 for each ton of her tonnage. In case the tonnage is not registered she will be assessed at such tonnage as the vessel can be ascertained to possess.

Several vessel companies located in Milwaukee, which were ready to remove to other ports of hail as a result of the alleged unequality of the assessment for taxes for 1895, will remain there, as the companies are satisfied to remain and pay the taxes that will be levied under the Austin law. The Milwaukee Steamship Co. had closed a deal to remove its entire fleet to South Chicago and incorporate under the laws of Illinois, while the Inter-Ocean Transportation Co. had completed arrangements to leave Milwaukee for the same reason. This latter company has a fleet of seven vessels, which have an aggregate tonnage of 8,600 tons, and last year paid in taxes, $6,400.

## A RELIC.

The Saginaw Bay Towing Association controls 17 tugs, many of which are engaged in log towing for the entire season. Among the fleet is the Peter Smith, which has had an interesting history. The vessel was built in Glasgow, to be used as a blockade runner during the late unpleasantness. Wilmington S. C., was one of the principal ports entered by blockade runners, and the Smith ran in and out of that port for two years of the war. When Wilmington was captured she was, unfortunately for her owners, within the port and became a government prize. The United States kept possession of the vessel for years, brought her to the lakes and used her in the government coast survey work. The Smith is of fine lines, rakish build, intended for great speed and not much of a cargo carrier, but during war times it didn't take much of a vessel to make big money in carrying contraband goods in and out of the blockaded ports on short trips.

## THE LONGEST TOW ON RECORD.

It is learned from our foreign exchange that the screw steamtug "Blazer" belonging to Liverpool, has sailed from the Mersey to perform what is probably the longest tow on record. The "Blazer" is engaged to tow the Italian steamer "Colombo" from Rio de Janeiro, in the River Plate, to Genoa, in Italy. The "Colombo" about three months ago was towed into Rio with her shaft broken, and since that time has been lying in that harbor. The distance from Liverpool to Rio is roughly speaking about 6,000 miles, while from Rio to Genoa is something like the same distance, so that both ways the tug will cover a distance of about 12,000 miles on her towing expedition. The "Blazer" only recently succeeded in refloating the stranded French steamer "Rhone", and towing her to Grand Canary. This steamer got ashore on the west coast of Africa, and the "Blazer" had to cover a distance of about 8,000 miles in her case. The "Colombo," which is now to be towed, is a large steamer of 2,394 tons register, so that the tow will be a heavy as well as a long and arduous one.

## THE SURVEY OF THE SAULT.

The hydrographic survey of the St. Mary's River, now in progress, is being made in connection with the improvement of the channel 20 and 21 feet in depth, between Chicago, Duluth and Buffalo, its primary object being to develop all shoal places in the river that may now or later require improvement for navigation purposes. Incidentally, the hydrography obtained will be used for the new charts of the river that will shortly be published by the lake survey. For the purpose of the survey, the river, from Point Iroquois light-house to Detour, is divided into areas, in accordance with the various changes in direction of the sailing lines, each area having as an axis the straight portion of the sailing line that passes through it. These areas are lettered A, B, C, etc., from the head of the river down stream. In each area lines at right angles to the axis or sailing line are sounded, and a sufficient number of cross sections of the river are thus obtained to develop the bottom thoroughly.

In making this survey, the entire force is divided into three parties, distributed over the various portions of the river. One party, consisting of two sounding crews, is under the immediate charge of Inspector L. P. Morrison, another of three sounding crews, under Assistant Engineer B. Rohnert, and the third of three sounding crews, under Assistant Engineer C. Y. Dixon. This makes a total of eight sounding crews, which, with gauge-readers, cooks, teamsters, etc., makes a total field force of 63 men, and, as a result, from 3,000 to 5,000 soundings are taken daily. At the close of February all of the hydrographic work was completed from Iroquois light-house to the upper end of Mud Lake. With only average ice, it is hoped to reach Point aux Frenes this winter, but if the ice remains as it has been for one month longer it is confidently hoped to reach Detour. Assistant Engineer Jos. Ripley has charge of the office computations, and has general supervision of the field work. The plotting of the soundings as they come in is done by Assistant Engineer H. von Schon, aided by Messrs. J. Conrick and A. J. Swift. The entire work is under the general supervision of Lieut. C. S. Riche.

## ELECTRICITY ON CANALS.

Electric towing was introduced upon the Bourgogne Canal, in France, on Aug. 20, 1893. This canal is 3.72 miles long, including a tunnel of 11,100 feet long, with a minimum depth of about 7 feet. Electricity, generated by turbines and operated on the overhead system, was substituted for steam towage at a total cost of about $27,000. According to a late report in the "Annales des Ponts et Chaussees," between Sept. 1, 1893, and April 1, 1894, the total traffic hauled was 80,794 tons in 897 working hours, at an expense of $1,180, including $60 for the use of steam towing during some slight repairs. During the same period in the previous year, using steam, the traffic was 78,639 tons, hauled in 917 hours, at a cost of $1,600. There was an evident saving in time and money by the use of electricity. For the transport of 1,000 tons, 11.65 hours and $20.40 were required with steam; and with electricity these figures were 11.01 hours and $14. While the time of service is too short to draw from it any very definite conclusions, the owners of the canal believe that the new system of operation will be profitable in the end.

## COMMERCE OF NEW YORK.

The total foreign commerce of the United States increased from $1,405,190,932 in 1885 to $2,010,341,036 in 1892, but fell off to $1,907,851,912 in 1893. New York's share of the total foreign commerce was $773,802,756 in 1885 and $1,061,220,878 in 1892, being more than one-half that of the entire country, the value of the goods entering and leaving that port alone being larger than the value of all the imports and exports at Boston, Philadelphia, Baltimore, New Orleans, San Francisco and every other port of entry combined.

# NEWS AROUND THE LAKES.

## BUFFALO, N. Y.

*Special Correspondence to The Marine Record.*

The G. T. R. has contracted for 520,000 tons of coal at a very low rate, $1.60 to $1.80 per ton to be delivered as follows: 400,000 tons at Suspension Bridge, 50,000 tons at Brockville, 40,000 tons at Pt. Edwards and 30,000 tons at Portland, Me.

Last Wednesday was the day fixed for the sale of the excursion steamers Pearl and Gazelle, the primary claim on which the boats were libeled, a $2,600 fuel bill, having been settled. There are a number of other claims against the boats, however, and they may yet be sold.

The work of improving the Ohio basin progresses in spite of the weather. Cribs are in position for the rebuild of the bridge and docks at the entrance, and the dredging will begin as soon as the spring opens. Plans have been prepared for a new bridge at Michigan street and it will be built as soon as money for the purpose is voted.

It is estimated that there are about 250,000 tons of lake coal here now, which is not large for the season. Not a word is said yet about spring rates. Charles S. Dakin, agent for Graeff, Wilcox & Co., of Philadelphia, has made a traffic arrangement with the Erie road and expects to enter the lists as a hard coal shipper from this port. He is also about to make arrangements for a shipping port on Lake Ontario.

A permanent organization of the canal forwarding interests was effected last Friday. They and the canal boats are acting jointly this year, and have elected O. A. Crandall president of their association. Thomas M. Ryan, John Baker, W. E. Witter, Frank Beadle, W. C. Jacus, Wm. F. O'Rourke, Jr., are prominent members. The details of the organization will be completed at a meeting to be held next Friday, when a freight agreement will probably be presented and signed.

Sloan, Cowles & Sloan, the Woodlawn Beach Excursion Co., the White Line Co., and the Crystal Beach Co. have made a joint offer to the city council of $1,500 rent for the foot of Main street, but ask the city to guarantee them a safe landing place. The excursion lines have made this move to get ahead of the Northern Steamship Co., whose passenger dock is next to Main street, the big steamship extending over on the Main street docks. This makes the acceptance of the excursion lines' offer more problematical than might at first be supposed.

## CHICAGO, ILL.

*Special Correspondence to The Marine Record.*

While moving down the river Sunday afternoon, the steamer Centurion grounded near Illinois Central A Elevator, and required three tugs to float her. She has 160,000 bushels of corn on board.

A weak feeling is reported in grain freights, the rates quoted being 1⅜ for wheat and 1¼ for corn to Buffalo, and 2¾ for corn to Kingston. The Vail and Baltic were placed for 110,000 bushels of corn to Kingston; the D. C. Whituey for 65,000 bushels of corn to Buffalo, and the Lansing and consort Olive Jeanette for 150,000 bushels of wheat to Buffalo.

## CLEVELAND, O.

*Special Correspondence to The Marine Record.*

Mr. M. A. Bradley returned from his California tour on Wednesday.

The Lake underwriters and surveyors are in session here this week compiling the annual edition of Inland Lloyds.

I received this week a handsome photograph, 10 by 14, showing the interior of the branch hydrographic office at this port, and its equipment.

The project to construct a fifteen-foot canal between Pittsburg and this port meets with favor but the engineering difficulties are said to be insurmountable.

Capt. W. S. Mack has been on a prospecting tour in the northwest for a couple of weeks. The trip resulted in his taking shares in some gold producing claims near Rainy Lake.

The navigation committee of the Chamber of Commerce recommend that the Secretary of War be requested to take such steps as will bring about an investigation which will show whether the Chicago drainage canal will affect the level of the lakes.

Capt. Thomas Wilson, manager of the Wilson Transit Line, must certainly have escaped the Florida blizzards of which we heard so much a few weeks ago. The captain is browned to the tan of an East Indian nabob and looks heartier than ever after his brief sojourn in the sunny South.

Quite a number of prominent marine men visited this port during the week, among whom were William Livingstone, president of the Lake Carriers' Association, Capts. James Millen, J. V. Tuttle, M. M. Drake, David Vance, J. J. McWilliams, C. W. Elphicke, Amassa Fitch, George McLeod.

It is so sometimes that the longer a man follows the sea the worse it treats him. Now, there is the case of Capt. George P. McKay, born, reared and used his active life afloat, goes off down the Ohio River on a quiet tour with his wife last week, expecting to reach New Orleans. He boarded the high-classed steamer Longfellow and the same day she struck a railroad pier, broke up and foundered in five fathoms, with loss of life. The captain and his wife escaped parish rigged, but the fact remains that the "Father of Waters" ought not to have treated a son of Neptune in so haphazard if not shabby a manner, conniving as it did to give him wet socks, besides clapping a stopper on his trip.

## DETROIT, MICH.

*Special Correspondence to The Marine Record.*

O. W. Shipman has contracted with the G. T. R. to deliver 750,000 tons of coal this season.

C. E. McElroy, managing owner of the steamer Unique was in Detroit Tuesday, making arrangements for having her two boilers taken out and replaced by two Babcock & Wilcox boilers.

The Frontier Iron Works have just shipped two triple expansion engines having cylinders 20″, 32″ and 54″ by 42″ for two steamers building by James Davidson, West Bay City. They have under construction two fore and aft engines 23″ and 46″ by 36″ and one 20″ and 40″ and 36″ for the car ferry steamer Chenango No. 1 building at Craig Shipyard, Toledo.

The Detroit Graphite Manufacturing Co.'s graphite paint is to be used on the iron work in the big Astor Hotel in New York, a 20-story structure that is to cost $8,000,000, at least the specifications call for this paint and no other. Capt. John Shaw, of the steamer E. C. Pope, says that this paint used in the water compartment of his steamer has stood a year and is now like it was when newly applied. I have also heard it spoken of elsewhere as the finest pigment known to apply on iron work.

The Detroit Dry Dock Co. are building steambarge (No. 120) for C. R. Jones & Co. of Cleveland, 185 feet keel, 36 ft. beam, 13 ft. hold; engine fore and aft compound 22″ and 42″ by 36″ stroke, cylindrical boiler 12 ft. 3 in. by 11 feet, steam pressure 125 lbs., to be out 1st May, cost $64,500. Building a steel side wheel steamer (No. 119) for the Sandusky and Islands Trans. Co., 165 ft. keel, 28 ft. breadth of beam, 51 ft. over guards, 11 ft. molded depth. She will receive the machinery of the steamer City of Sandusky. She will have feathering type paddle wheels and the Howden hot draft system will be fitted to her boiler. She will cost about $75,000 and will be ready by the opening of the excursion season. They are also building a cylindrical boiler for the steamer Schoolcraft and fitting the Howden hot draft to the boilers of the steamers building by Capt. James Davidson at West Bay City.

S. F. Hodge & Co. are building three fore and aft compound engines for the United States and Ontario Trans. Co. for the car ferry steamer Chenango No. 2, building at the Craig Shipbuilding Co., Toledo. The dimensions of the cylinders of the two aft engines are 23″ and 46″ by 36″ stroke and of the forward engine 20″ and 40″ by 36″ stroke. They are building a triple expansion engine, cylinders 11″, 18″ and 29″ by 18″ stroke for Geo. T. Arnold, of Mackinaw Island to be placed in a passenger steamer building at Benton Harbor by E. W. Heath, also a triple expansion engine with cylinders 10″, 16″ and 26″ by 16″ for Commodore Mills of Detroit for a steam yacht building at the Detroit Boat Works. A triple expansion engine, cylinders 9¼″, 14″ and 24″ by 14″ stroke for a steam yacht built for Edw. Henkel ot Detroit by the Detroit Boat Works. In repair work they are putting a new air pump in the steamer George F. Williams at Chicago and a new bed plate and general repairs to the engine of the steamer Chauncey Hurlbut.

At the Detroit Boat Works there is one steam yacht ready for lannching built for Edw. Henkel, Detroit, length on water line 98 ft., over all 115 ft., beam 16 ft. on deck 14 ft., on water line 9 ft. molded depth, to be schooner rigged. She is splendidly finished and furnished. She will have an engine by Hodge & Co. and a water tube boiler by H. H. Hardy, Detroit. They are also building a steel steam yacht for Commodore Mills, Detroit. Length on water line 110 ft., over all 132 ft. beam, on deck 17 ft. 6 in., depth 9 ft. She will be schooner rigged and will have an engine built by Hodge & Co. and a water tube boiler built by H. H. Taylor, Detroit, with 40 ft. grate surface and 1600 ft. heating surface. They have nearly completed a new style life boat built to the order of the Huebner Life Saving Boat Co., Milwaukee, Wis. and patented by Paul Huebner. Her dimensions are 30 ft. over all, 8 ft. beam, 8 ft. hold. The principal feature of this boat consists in a turtle back reaching from stem to stern which has two sections on each side amidships of about 4 ft. in length which can slide down or be closed up water tight. The sections are constructed on the principle of a roller desk top, shutters winding around drums located under seats on each side. The motive power in this first boat consists of a horizontal bar of iron fitted with a large number of handles, permitting about 20 persons in the boat to transmit their strength through a system of gearing to a propellor wheel located amidships and working partly in a hollow casting. The intention of the Company having this boat built is to substitute an engine of about 20 h. p. in future boats to be built.

## TOLEDO, O.

*Special Correspondence to The Marine Record.*

The schooner Itasca received new top sides and a general overhauling. The schooner Arthur has received similar repairs. The schooner Penokee is receiving general repairs.

Nagle & Hall, vessel brokers and insurance agents, Marine Building, are agents here for steam lighters with or without derrick, also steam wrecking pumps, long distance telephone.

The Craig Ship Building Co.'s new dry dock will be completed about May 1. The dimensions of the new dock are 400 feet long, 100 feet wide on the top, 50 feet wide at the bottom, 16 feet on the miter sill.

The Wabash Line steamer Russell Sage, has received new wale strakes, general repairs and calking from the light water mark up, also considerable repairs to boilers and new smoke stack. The steamer J. C. Gault will receive similar repairs..

At the Craig Ship Building Co.'s yard the steamer Gettysburg has had her upper deck taken off and will in future be a single decker and will be used for carrying lumber. The steamer Volunteer and tug Torrent have received general repairs and calking. The work on the two car ferry steamers Chenango Nos. 1 and 2, is being rapidly got along with. No. 1 is all up in frame and has one half of her ceiling in and will be completed by July 1. No. 2 is not fully in frame yet, she will be complete by August 1.

## PORT HURON, MICH.

*Special Correspondence to The Marine Record.*

The schooner John Wesley will be fitted out with three pole spars.

The lake tug George E. Breakway will be recalked and will receive other repairs.

The schooner Wm. A. Young is receiving a new rail and is being calked at the Wolverine dry dock.

The steamer Ed Jenks is being recalked and is receiving a general overhauling at the Wolverine dry dock.

The Kittie M. Forbes has been entirely rebuilt forward, where she was damaged by fire at Duluth last fall. She will have only one mast this season.

The steamer City of Mt. Clemens is receiving a thorough overhauling and repairing at Mt. Clemens. She will carry salt from Tawas to Ohio ports for the Michigan Salt Co.

The Monahansett, Madagascar, Byron Whitaker and W. F. Sauber have discharged their cargoes of corn. The next to be unloaded will be the Geo. Stone and Nicaragua.

The steamer Rhoda Stewart was not sold for taxes as so widely reported. The owner paid them under protest. He was a resident of Monroe, Mich., at the time the tax was assessed on the boat, and will not pay in both places.

Capt. John Atwell has been making some decided improvements upon the steamer Harry Cottrell at this port during the winter. He has lowered the pilot house and given the vessel new upper works forward, promenade deck and bulwarks.

The new steamer Linden, of the Jenks Ship Building Co., is receiving her oil and engine at the Phœnix Iron Works. The cabins are being put in and they will ship her masts this week. She will run in the copper trade from Lake Linden to Buffalo.

The tug Merrick, which has been lying in Black River all winter, steamed up last Thursday and dropped out of the river. Several hundred men stood on Military street bridge and watched the boat break the ice in the river. The ice is about 16 inches in thickness.

Captain F. L. Merryman has just beat the world's record in blowing a bucket off of the steamer "Mary's" wheel. All other jobs of that kind for years have had to have a diver at a large expense, but he did the job without the aid of a diver and the captain of the "Mary" says it is a first-class job and as good as if they had had a diver.

Capt. A. E. Johnson of the steamer Westcott, started on the 4th inst., to cross Traverse Bay in a sleigh with his wife, daughter and Mrs. Louis Miller. The ice broke precipitating all into the water and they had a narrow escape from drowning. While walking a mile and a half to the shore their clothing was frozen stiff. The team was not rescued.

Capt. Frank Hebner has not yet received his insurance money for the burning of the steamer Concord, at Toledo, over a year ago. The boat was owned by Capt. Hebner and W. F. Botsford, but the insurance was in Mr. Hebner's name. The insurance company refuses to pay the loss on Mr. Botsford's half interest. It is expected, however, that an adjustment will soon be made.

A man from Sand Beach says that there is ice as far as the eye can see, with a brisk southwest wind it will only blow off about three or four miles and there it stops. Lexington also reports any amount of ice. The wind has little effect in blowing it out into the lake. There is lots of ice as far as one can see from Fort Gratiot lights. We will give current reports of ice here each week. There has been no weather here that would interfere with the ice. It is warm and pleasant through the day, but will make ice every night.

## GREEN BAY, WIS.

*Special Correspondence to The Marine Record.*

Sturgeon Bay is practically clear of ice.

The ice in Green Bay is four feet thick.

It is hoped to have the work on the government piers at Menominee completed by the opening of navigation.

The life-saving station at Sturgeon Bay canal will open at 12 o'clock on Monday, April 1. Carl Anderson will be keeper.

Preparations are now being made at Kewaunee to get the schooner Exchange into shape by the opening of navigation. Capt. C. O. O'Hara of Sheboygan will have charge of her.

Captain H. W. Hart, who has been taking treatment for his eyes ever since the close of navigation is still suffering from his affliction, but says his doctor promises to have him ready for the spring opening.

Repairs to the steambarge Sawyer are rapidly nearing completion. She will go into the stone trade between Sturgeon Bay and Lake Michigan ports, and Captain Larson expects she will have a busy season.

The schooner Rob Roy is being fitted out at Racine, and will go into commission the last of this month. The steamer City of Grand Rapids has been sold to Buffalo parties, who will put her into the excursion business.

The steambarge Seymour is receiving a new cabin and some other changes and improvements above the water line. Captain John Bolton, of Milwaukee, will sail her this season, with Q. O. Helmboltz, of Sturgeon Bay, engineer.

## DULUTH AND WEST SUPERIOR.

*Special Correspondence to The Marine Record.*

The Superior Yacht Club is being reorganized on a more substantial basis. Nearly 100 new members have been admitted.

C. E. Pratt, chief promoter of the St. Paul, Minneapolis & Ashland, the proposed new road from Minneapolis to the Lake Snperior, was in the city last week. He gives the assurance that the road will be built this year, with terminals at Ashland and Bayfield.

The Standard Salt Co., of Chicago, has leased the Tower Slip warehouse for one year. J. I. Rooney, of St. Paul, who is general manager of the company, west of Chicago, will probably locate in Superior, where his business is to be centered. The warehouse capacity is about 250,000 barrels for this year's experiments.

A Duluth correspondent of some of the Western dailies is trying to stir up trouble for the Lake Carriers' Association, by stating that that organization was about to enter into a fight against the Longshoremen's Union at this end of the lakes. The story is doing very little harm here, as assurances have been given that whatever change was made, it was desired to keep the men as long as possible.

The Nemadji Boom Co. held its annual meeting last week. The company owns the boom privileges of the Nemadji River, and proposes to drive between 50,000,000 and 60,000,000 feet of logs this spring. Three hundred men will be employed at the work for at least five months. The company handled in 1893, 12,000,000 feet of logs in that winter, and 24,000,000 in 1894. The great increase is owing to the cut of scorched pine, which was in the path of last summer's forest fires. It had to be cut out this winter, or it would become a total loss.

## ASHTABULA HARBOR, O.

*Special Correspondence to The Marine Record.*

Hingston & Woods, the Buffalo dredging contractors are arranging to bid on some dredging that is to be done by the Lake Shore Railroad in its slips here.

Chris Crandall, who left here last summer in the steam yacht Countess, came home last week from Annapolis, where he had left the yacht. He found the trip very interesting and enjoyable.

A good deal of indignation has been expressed at the discontinuance of the Harbor postoffice. All the shipping interests depend largely upon the postoffice in the season of navigation, and pressure has been brought to bear to have the office reinstated.

The government rock dredging contract, which, as announced in last week's RECORD, has been awarded to Carkin, Stickney & Co., calls for a channel 20½ feet deep, and stipulates that the rock must be cut to within 18 inches of the pier. This must be done before dredging is commenced.

A large amount of new dock machinery is to be added to the Ashtabula equipment next season. Four legs will be added to the No. 1 ore dock on the Pennsylvania property. This company will spend, it is said, $100,000 on its Ashtabula docks this spring. The P., Y. & A. is preparing space for the location of a new trestle.

The fish tug W. B. Davis, owned by H. Parker, of Erie, caught fire from the banked fires under her boiler, and was badly damaged before the flames could be subdued. In trying to quench the flames, the fire department pumped so much water into her that she foundered. She would have had extensive repairs at Erie, had her owner been able to get there. She was insured for $1,700, which will, her owner says, cover the damage done by fire and water.

## THE THOUSAND ISLANDS.

*Special Correspondence to The Marine Record.*

The Magnet, of the Richelieu & Ontario Navigation Co.'s fleet, is being rebuilt and will have her name changed to the Hamilton. She is to ply between Toronto, Kingston and Montreal.

Capt. E. W. Visger is building a new steam yacht for the accommodation of the summer tourists. When she is completed the captain expects to have a fast one, and the most comfortable and commodious yacht on the river.

Capt. H. Dergaro, owner of the steam yacht "Sirius," will put a new boiler in his yacht in a few days. A new boiler will also be placed in the steam yacht "Spry" by the owner, Capt. John Dingman. The new boilers have been built by the Watertown Steam Engine Co. and are expected here in a few days.

Charles White, who has been chief engineer on the steamer New Island Wanderer the last two seasons, will handle the engine on the steamer Sport the coming season. Charley will be missed on the Wanderer. George Willix, who was chief engineer on steamer for two or three seasons, and who has been on the upper lakes the last three years, goes back to his old post on the Wanderer.

## APPOINTMENT OF OFFICERS FOR 1895.

| | MASTER. | ENGINEER. |
|---|---|---|
| CAPT. JOHN JENKINS, MNGR., MARINE CITY. | | |
| Str. W. H. Sawyer | John Jenkins | Nelson Gaulette |
| Schr. C. E. Redfern | Wyman Powers | |
| " A. C. Tuxbury | J. C. Angell | |
| CHAS. HEBARD, PEQUAMING. | | |
| Prop. Chas Hebard | Jas. Parsons | W. Schumacker |
| Tug Dan'l L Hebard | Hugh McKinzie | Jos. Greenleaf |
| " Jay C. Morse | Fred. C. Rogers | Chas. Fisher |
| Schr. Aloha | Wm. Elliott | |
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| " John Mitchell | W. H. Cowin | P. Lavely |
| " W. H. Gratwick | R. Jackson | Frank Parker |
| " Ed. Smith 1 | C. D. Miller | M. Townsend |
| " Ed. Smith 2 | Hoyt Townsend | Henry Graves |
| New boat building at West Bay City | C. B. Galton | Edward Guy |
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| " S. E. Marvin | Wm Brines | |
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| " Wallula | C. J. Holmes | E. Ellsworth |
| " Sitka | C. A. Benham | Elmer Ennis |
| " Olympia | A. M Sheppard | Fred. Harmon |
| " C. Tower, Jr. | C. C Tousley | A. Williams |
| Schr. Yukon | Wm. Forbes | |
| " Wadena | ............... | |

## NOTES.

THE German press denounce the opposition of the British shipping interest to the resolutions of the Washington Conference in regard to the rule of the road at sea. They assert that the pre-eminence of the British merchant marine is maintained by its cheap freights, which are only rendered possible by the neglect of efficiency and of the most elementary precautions against danger to human life.

THE "Providence" capstan, as made by the American Ship Windlass Co., has made for itself a reputation which induces people all over the world to call for it in their specifications. It is quite common, even in Europe, in the specifications for a new ship for the "Providence" capstans to be called for. They are now, it is believed, as well known there, particularly in Great Britain, as they are in the United States.

### SUPERINTENDENT 10TH L. S. DISTRICT.

Sand Beach, Mich., with its valuable and commodious harbor of refuge is a fitting port for the headquarters of the superintendent of the 10th Life-Saving District, comprising the 16 stations on the shores of Lakes Huron and Superior.

The present superintendent, Jerome G. Kiah, was born in Ogdensburg, N. Y., May 4, 1843. At the age of 17, he commenced sailing on the lakes and after a somewhat eventful though successful career, he joined the U. S. Life-Saving Service, and in 1878, when the station was first established, he was appointed keeper of the Point aux Barques station on the coast of Lake Huron. Capt. Kiah exercised such a high degree of proficiency and skill while holding the position of keeper, coupled with attainments of such high order, that in 1880 he was selected as superintendent of the district, a position which he has since held, being further advanced in 1892, through being designated as a member of the national board on life-saving appliances. The keepers, surfmen and all with whom Capt. Kiah is or has been brought into contact, speak of him in the highest terms and it is strictly correct to say that he is one of the best-liked men in the service.

### REMINISCENT.

SOMBA, ONT., March 13, 1895.

*To the Editor of The Marine Record:*

I am pleased to watch the lively course of events in lake shipbuilding, the building of piers and concrete breakwaters, the 21-foot channel, the new bridges across our narrow harbors, the advent of steam towing machines, and the general improvements marching along at a rapid gait in all maritime and kindred interests.

For about four-score years have I been identified with the lake marine and I now begin to think it is near time that I took my departure, but before doing so I must conquer the new-fangled rule of reckoning by civil time as opposed to nautical, then with latitude by Pole Star and longitude by account, I can prick off my position at midnight and end the day's work in a modern up-to-date fashion.

THE RECORD, however, may contain another reminiscence or so from me, so here goes: In 1859, Mr. T. P. Handy, of Cleveland, sent me to buy a cargo of staves for his two vessels, Warner and Harmon, at St. John's Mich. I purchased from a Mr. McComber, 25 M. feet, paying $250 down, the balance to be paid when the staves were culled and piled. After being at work three days I was informed that the staves belonged to a merchant whose brand was on the end of each, and he told me that McComber was a rascal. I then re-purchased from the merchant along with a lot more and left for Ionia. Being informed a few days later that McComber could be found at home, I hastened back and demanded the $250 I had paid him for another man's staves. He refused to refund and I took him by the collar, threw him down, and at the point of my knife made him give up $140 he had in his pocket as well as a check on the bank for $100, so after all I only lost $10. Mr. Handy, hearing of the circumstance, wrote me saying, that he thought I must have read that impressive passage of scripture which says, "Pay that thou owest." I am not much on scripture, but remember that a handful of years ago a ship reached New York and a seaman, who lived in the same village as the captain, was sent off at once with a letter to the master's wife acquainting her of the safe arrival of the ship, etc. The following day being Sunday, Jack told his wife that he would attend meeting and see all the neighbors, so that he would not have to call on them. The text that day was from Rev., XX Chap., "I saw an angel come down from heaven having the key of the bottomless pit and a great chain in his hand. He laid hold of the serpent, which is the devil and satan, and cast him into the bottomless pit and set a seal on him that he should deceive the nations no more for a thousand years." Jack went home overjoyed to his wife and told her they would have no more trouble for a thousand years, because the devil was in safe moorings, having just been brought to an anchor in the bottomless pit. Having heard such wonderfully good news Jack attended church on the following Sunday and heard the text that "the devil was going about like a roaring lion seeking whom he might devour." Jack was struck flat aback at this news and on Monday called upon the sky pilot, who was very cordial and told Jack that he had had the prayers of the church while on his long voyage. Jack replied, "Did you not say Sunday before last the devil was chained in hell?" "I did, John," replied the parson. "And yesterday you said he was going about like a roaring lion?" "That is right." "Then, what I want to know," said the sailor, "is how long might his cable be?" To which the sky pilot replied, "From one end of the earth to the other, and around the earth and across the earth, that he was everywhere." Jack mused for a moment and told the parson that with so long a cable he thought they might let the lubber loose altogether.

CAPT. CHARLES GALE.

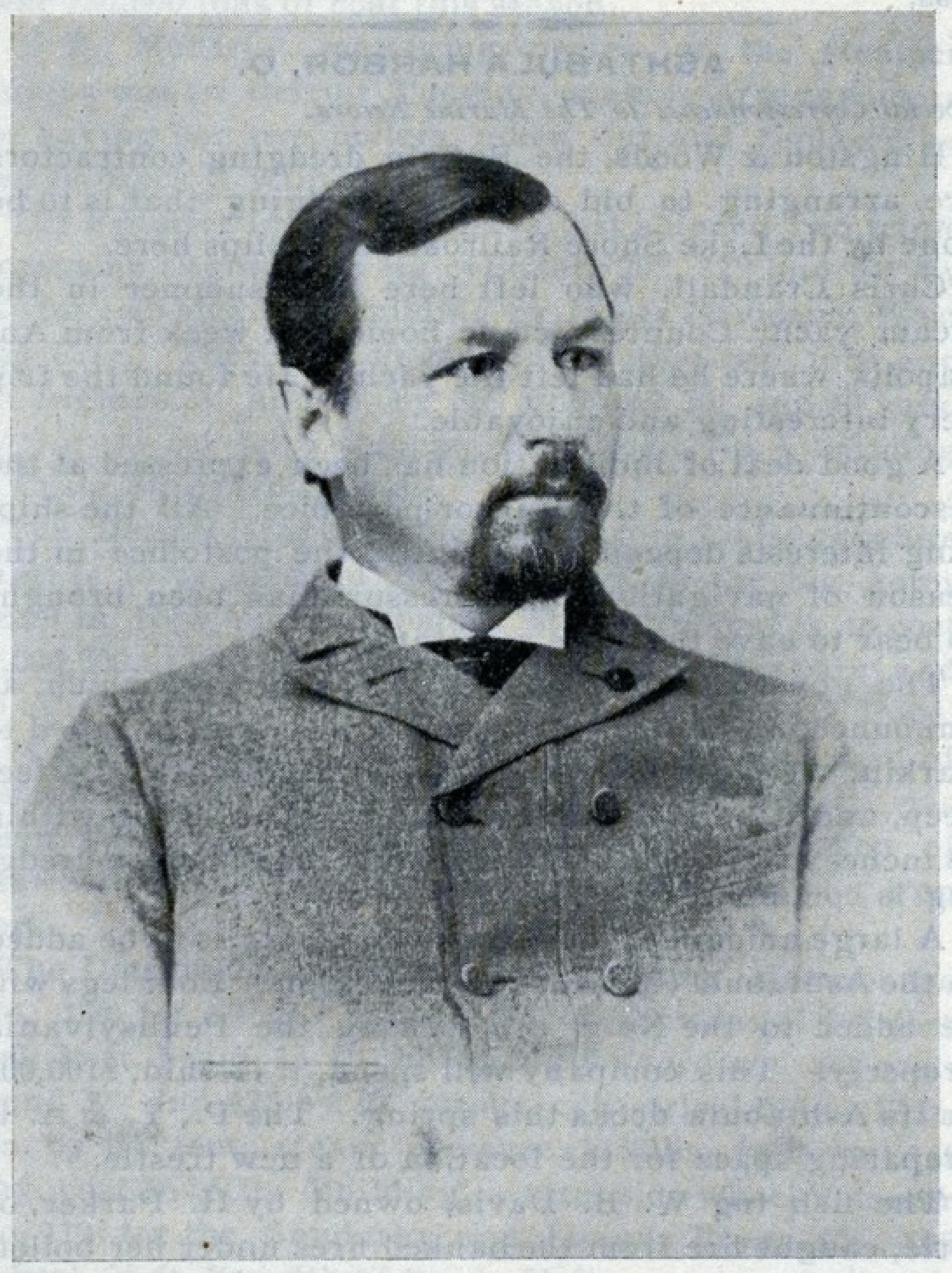
### A LAKE CLASSIFICATION SOCIETY.

CLEVELAND, O., MARCH 13, 1895.

*To the Editor of The Marine Record:*

In reply to the letter of a "Retired Shipmaster," in your last issue, I would like to call attention to a few points. From the tenor of "Shipmaster's" letter, it might be imagined that I had made an attack on shipmasters as surveyors, while in reality my letter was on classification societies, with a word on surveyors thrown in. If the shoe did not fit him, how has he put it on and allowed it to pinch so? Readers of THE MARINE RECORD know all about the Bureau Veritas having flourished for seventy years on the coast, but that society has no rules that are applicable to lake tonnage. What has been advocated lately is for a society which shall be neither French nor English, but American, and with rules suitable for classification of lake vessels. A "Retired Shipmaster's" remark about the wicked shipbuilders is quite uncalled for, as lake shipbuilders are as conscientious as any in the world. But perhaps your correspondent can tell us why it was that so many thousands of dollars have been spent lately in strengthening new vessels that had just been classed by the various societies. I am sorry to see that our friend has misquoted me a good deal in his very imperfect review of my letter. With regard to surveyorship of captains, take a simple illustration. Does it follow that because a man lives in a house until he is past middle age, that he is able to design, get out specifications, and build one? Certainly not. My critic closes his letter by saying in substance that a practical shipbuilder has as much to do with the qualification of a surveyor as the man who carries bricks and mortar has to do with the work of the eminent architect. What an allegory. Does he think for a moment that such an illustration as that would strengthen his position? I should say, take the man who lives in the building, that was erected by the man carrying the bricks and mortar, and designed by the eminent architect, and then you have the retired shipmaster position as a surveyor. In other words, our friend is placing himself in the position of the eminent architect, when without the necessary practical training, he cannot be familiar with naval design.

W. J. W.



JEROME G. KIAH, SUPT. 10TH L. S. DISTRICT.

### THE FLIGHT OF HOMING PIGEONS.

SARNIA, ONT., March 12, 1895.

*To the Editor of The Marine Record:*

Whether or not it would be advisable, under certain conditions, to carry a number of pigeons on any short cruise must of course rest with those chiefly interested; although the U. S. Navy, the lake passenger line between Cleveland and Buffalo, as well as vessels engaged in special work, have experimented with homing pigeons.

Out of a flock of seventy excellent birds, a number of which, I have imported and all of which are of the very best breeds, I can give you the record of a trio I have named Monte Carlo, Captain Von and Watchman. Monte Carlo made his first flight from Stag Island to Sarnia a distance of only eight miles then from Port Lambton, St. Clair Flats and Detroit. After these tests I shipped him on the tug Porter and after being liberated at the "Dummy" on Lake Erie he reached home all well in the incredible short space of seven hours. Shortly after he was flown from Pt. aux Barques but took four days to reach home, his next flight was from Cheboygan and he wended his way home in four and a half hours. After these lake tests I concluded to send him over land and he made rapid journeys home from Buffalo, Charlotte, Hornersville, Battle Creek, South Bend and finally from the Columbian Exposition.

Capt. Von and Watchman have generally flown together from Chicago in nine hours, from Buffalo in *three and a half hours, Tobermory in six hours, but in this latter trip Watchman came home after having had a struggle with some other bird as he was badly injured. The last flight of Watchman and his nest mate, a sister bird named Stewardess, was from Syracuse, N. Y. to Sarnia, Ont., when within sixteen miles from home Stewardess was attacked by a hawk and fell to the ground at Wyoming injured so that she died next day, the postmaster of that place notified me of the result of the flight after finding my address on a tag fastened to the bird's wing.

EDWARD LOVELY.

(*Three and a half hours seems too short a time for the flight between Buffalo and Sarnia, perhaps thirteen and a half is meant.—Ed.)

### IMPORTS AND EXPORTS.

The following is a statement of the imports and exports of the United States and the several European nations for the year 1892, compiled from the report of the chief of the Bureau of Statistics of the United States Treasury Department, and from the Statesman's Year Book for 1894:

| | Imports. | Exports. |
|---|---|---|
| United Kingdom | $2,062,393,000 | $1,419,267,000 |
| Germany | 1,006,027.000 | 749.725 000 |
| France | 991,228,000 | 878,397,000 |
| The United States | 840,931,000 | 938,421,000 |
| Belgium | 702,840,000 | 661,750,000 |
| Holland | 527,870,000 | 470,710,000 |
| Austria-Hungary | 259,070,000 | 301,135,000 |
| Italy | 244,970,000 | 201,930,000 |
| Russian Empire | 199,770,000 | 244,705,000 |
| Switzerland | 187,635,000 | 136,605,000 |
| Spain | 145,453,000 | 141,398,000 |
| Turkey (1891) | 103,115,000 | 57,765,000 |
| Sweden | 99,730,000 | 91,210,000 |
| Denmark | 90,150,000 | 70,090,000 |
| Roumania | 76,150,000 | 57,075,000 |
| Norway | 55,050,000 | 35,120,000 |
| Portugal | 53,430,000 | 52,525,000 |
| Greece | 23,210,000 | 17,195,000 |
| Bulgaria | 15,460,000 | 14,730,000 |

### TO TEST THE KATAHDIN'S METACENTRIC HEIGHT.

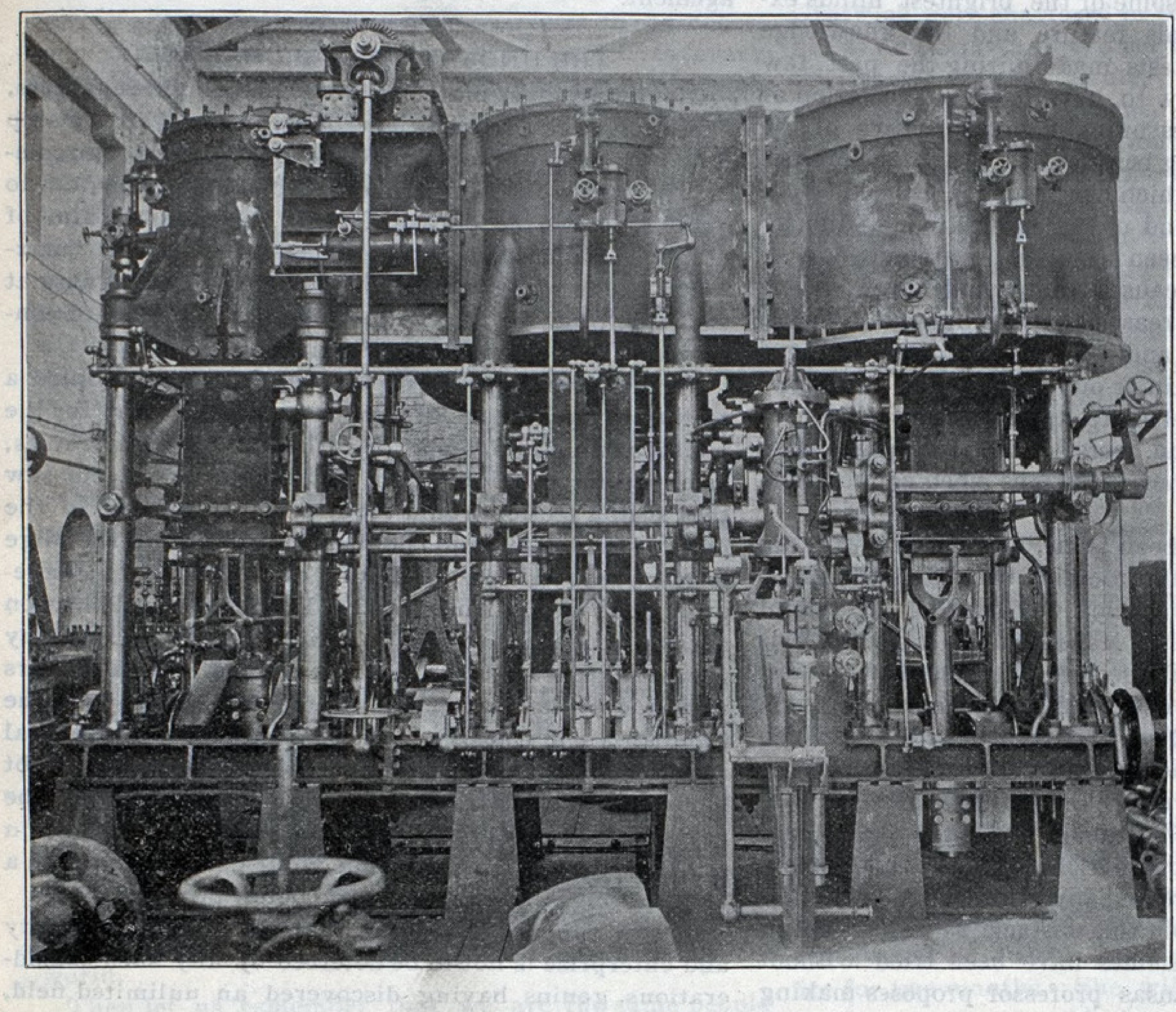
A scientific test will be made upon the Ammen ram Katahdin, to develop the ram's metacentric height. Practically the test means that the ram's center of gravity and point of water pressure will be ascertained. The test is of the greatest importance. Naval Constructor Hichborn, in charge of the construction and repair department at the navy yard, Naval Constructor David W. Taylor, and other navy officials and principals from her builder's yard, the Bath Iron Works, Me., will attend the tests which are expected to take place on the 25th inst.

### ENGINES OF THE U S. ARMORED CRUISER "MAINE."

(ILLUSTRATED.)

The Maine is a twin screw armored cruiser 324.4 feet over all, and the largest vessel ever built in any of our navy yards. As completed she carries two military masts and two funnels.

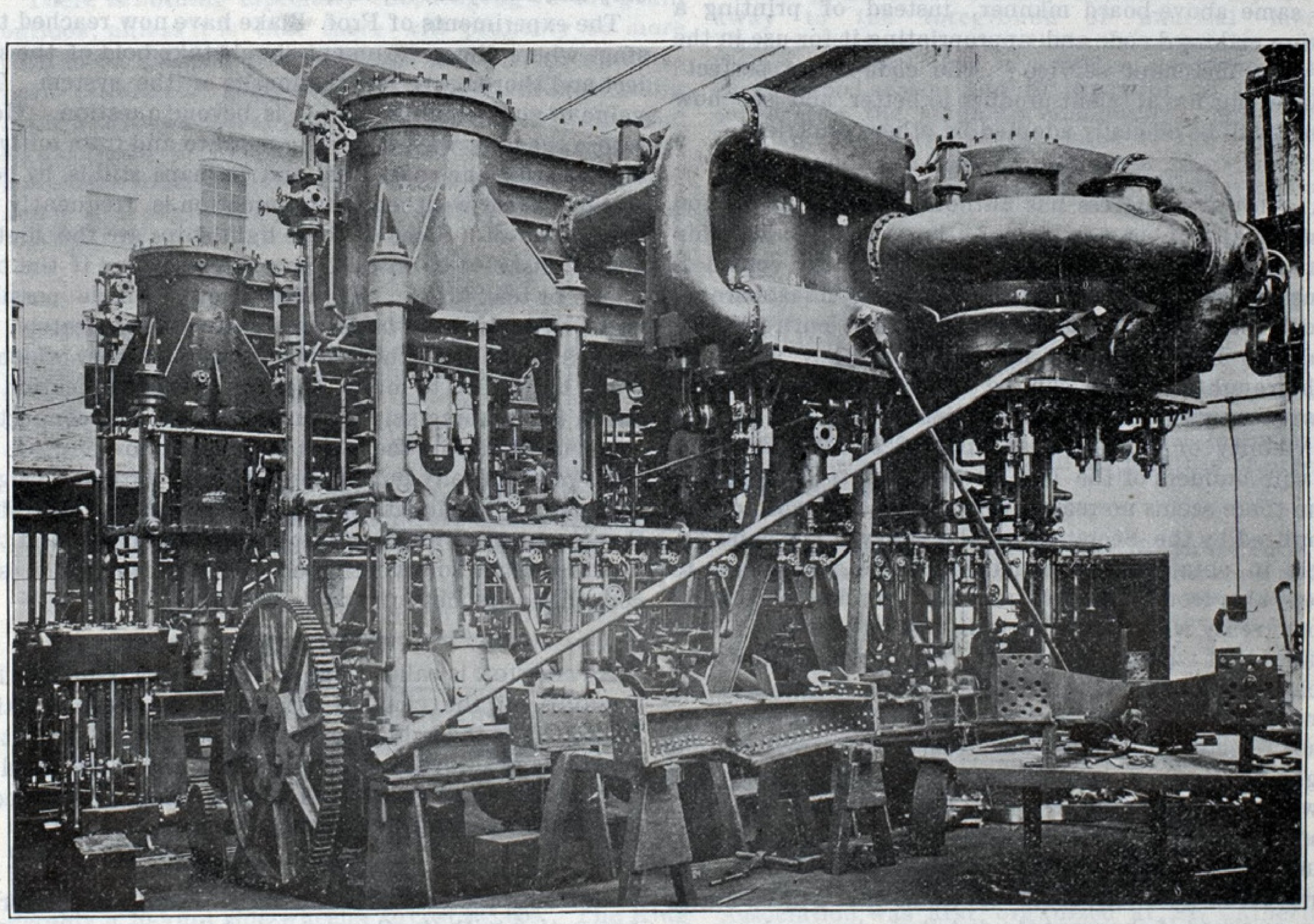
The American Ship Windlass Co. are in evidence in the equipment by furnishing the "Providence" windlass and steam capstans. The windlass is capable of raising both bower anchors at the rate of six fathoms per minute, with steam of 80 pounds pressure, and of exerting an aggregate stress of 280,000 pounds on both bower chains, with steam of 130 pounds pressure at the boilers. The steering engine and gear is of the well-known Williamson Bros.' type, of Philadelphia, and is capable of putting the helm hard over from amidships in ten seconds when the vessel is steaming at a speed of 17 knots an hour. It can be operated either at the engine, from the conning tower, the pilot house, the bridge or the superstructure deck, or disconnected and used by hand.



ENGINES U. S. S. "MAINE."

The machinery of the Maine was built from Navy Department plans by N. F. Palmer, Jr., & Co., the Quintard Iron Works, New York, and called for an I. H. P. of 9,000, at a contract price of $735,000. The main engines, herewith reproduced from cuts furnished by the Journal of the American Society of Naval Engineers, consist of two vertical inverted cylinder, direct acting triple expansion engines, with diameter of cylinders, H. P. 35½ inches, I. P. 57 inches, L. P. 88 inches, by 36 inches stroke, each separated by a fore and aft bulkhead. The high pressure cylinder of each engine is placed aft, and the low pressure cylinder forward, the latter being so arranged that it can be disconnected when working at low power, the high and intermediate then working as a compound engine. The main valves are of the single ported piston type, one for each high pressure cylinder, two for each intermediate, and three for each low pressure cylinder, 22 inches in diameter, all worked by Stephenson link motion, with double bar links. Each high pressure valve is worked direct, the intermediate and low pressure valves by rock shafts, each rock shaft being connected to its link by an equalizing bar, the upper end of which is carried by a radius link of such lengths as to minimize the slip of the link block. The cut-off may be varied from 0.5 to 0.7 of the stroke, each reversing arm being made with a slot fitted with a composition block, which is adjustable by a screw and hand wheel. The engine frame consists of hollow wrought steel columns, excepting a single inverted Y column supporting the intermediate cylinder. The columns are stayed by horizontal steel brace rods and by athwartship diagonal braces. The engine bed plates are of cast steel in three sections, flanged and bolted together. The crosshead gibs and all of the principal braces of the main engines are fitted and lined with Parsons' white metal. The main engine straightway stop valves are arranged to be worked from the engine room, and are also fitted with gear for operating them from the berth deck.

The reversing gear of each engine consists of a steam cylinder and a hydraulic controlling cylinder placed vertically, and acting directly on an arm fixed on the reversing shaft. The valve of the steam cylinder is of the piston pattern, connected to a by-pass valve on the hydraulic cylinder, and is worked by a continuation of the stem of the steam piston valve. These valves are worked by a system of levers, the primary motion of which is derived from the hand lever at the working platform, and the secondary motion from a pin on the reversing arm. There is also a pump for reversing by hand, the by-pass pipes of the hydraulic cylinder, which pass through the valve-box of the hand pump, being so arranged as to leave the hand arrangement always in gear. The diameter of the steam reversing cylinder is 20 inches, the diameter of the controlling cylinder 10 inches, and the stroke 27 inches.



ENGINES U. S. S. "MAINE."

Each engine is fitted with a throttle valve consisting of two gridiron slide valves placed horizontally, one above the other. The lower slide valve is actuated by a steam cylinder and a hydraulic controlling cylinder, placed horizontally and acting directly on the spindle of the valve. The steam piston is operated by a piston valve, which is controlled by a floating lever so fitted that the throttle valve will follow the movement of a hand lever at the working platform. The upper slide valve is worked by a screw stem, the gear operating the stem being worked by a hand wheel at the working platform. The steam actuated throttle valve is intended for use in quick working, and the hand-moved valve for fine adjustment.

Each main cylinder is fitted with starting valves of the piston type, each complete in itself, with both steam and exhaust ports, and worked by a lever at the working platform, the levers being placed in the same order as their respective valves, and arranged to move in the same direction as the desired motion of the piston.

The main steam pistons are of composition, with double shells, and are each fitted with two packing rings ⅝ inch wide and ⅝ inch deep, set out by steel springs bearing against a flanged floating ring fitted to have an easy play in the piston. The piston rods are of forged steel, the lower end of each rod being enlarged to form a crosshead and fitted with an adjustable brass and a composition cap. The connecting rods are of forged steel, 72¾ inches between centers. The crosshead end of each rod is forked to span the crosshead brasses, and each eye at the end split and fitted with a bolt for gripping the crosshead pin. Each crosshead is fitted with a wrought-iron slipper, dovetailed and shrunk on and further secured by tap-bolts. A composition guide, 22 inches long by 20 inches wide, in two parts, is fitted to each slipper, secured at the lower end by a flange and studs, and at the upper end by square headed bolts in slotted holes. The cross-head guides are of cast iron, and are hollow for water circulation.

Each main crank pin is additionally provided with centrifugal oiling device, fitted on the face of each crank. There is a globe oil cup for each piston rod, and one for each end of each valve stem, also one for each piston valve and connected with a small hand pump for ensuring the oil running to the place desired. The eccentrics are lubricated in all positions. Efficient sight feed oil cups are fitted to each main steam pipe, and on each air and circulating pump, blowing, main feed and bilge pump engine.

The main engine straightway stop valves are arranged to be worked from the engine room, and are also fitted with gear for operating them from the berth deck. The screw stop valves fitted in the main steam pipes immediately inside the engine rooms are fitted with gear for working them from both engine rooms.

# THE MARINE RECORD

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CLEVELAND, O., MARCH 14, 1895.

SEVERAL important articles are unavoidably held over for our next issue.

JOHN G. WALKER, rear-admiral U. S. N., chairman of the Light-House Board asks for proposals for the construction and delivery of a first class composite built light-vessel. The limit of time placed for the bids to be submitted extends to April 11. A number of light-vessels as well as light-house tenders have been built at lake shipyards, and, as there is no treaty stipulations to stand in the way, lake shipbuilders should enter into close competition for this departmental tonnage.

A CORRESPONDENT writing under the non-de-plume of "Pro Bono Publico," in the last issue of THE RECORD, takes exceptions to our stating that the "International Code of Signals" used by the navy as well as merchant vessels and departmental tonnage, required to be formally recognized before its adoption as a national code, otherwise, we argued that it was simply a matter of purloining and this, too, in a national, not a departmental sense. Other nations have placed their seal of approval on the code and adopted it for the use of their national as well as merchant ships. Why can't the United States act in the same above-board manner, instead of printing a foreign endorsed code and appropriating it for use in the navy and merchant service? The code is not perfect! Now let our naval talent produce a better and see how soon it will be officially adopted by other countries.

ALTHOUGH Congress has authorized the construction of six small gunboats in lieu of a large costly battle ship there is but little chance for any of the new contracts being placed at lake shipyards. As the gunboats are intended for shoal water and river work it is entirely practicable to build them at lake ports, as they will be of such draught that they can be transferred down the St. Lawrence when completed. These vessels will cost in the vicinity of $1,500,000, or about $250,000 each and if the ship builders of the lake ports desire to compete for them there seems no reason why they should not do so if permitted by the Secretary of the Navy. The chief obstacle in obtaining the sanction of the government to accept bids from lake shipbuilders would be in relation to our treaty with Great Britain and on this point, it is recalled that when Congressman Wheeler, of W. Bay City, Mich., presented the lowest bid for the construction of the Bancroft during the Harrison administration, Secretary Tracy rejected it because our treaty with Great Britain might be strained by such action. Those who recall, however, the fact that at a later date the Dominion government constructed at Owen Sound, Ont. three revenue cutters or fishery cruisers quite as formidable as the gunboats in question, begin to think the United States may go ahead if she wants to distribute her work among the shipbuilders of the lakes. Iron and steel at lake ports is cheaper than elsewhere, and the ship builders of the lakes have proven themselves the equal of those of any part of the country on vessels much larger than these small gunboats so that in all fairness they should be allowed to bid on the new work.

## COMMUNICATION WITH LIGHT-SHIPS.

The English light-house authorities have for years experimented with various devices intended to open communication between outlying light-houses and light-ships. If we remember rightly, a light-ship off the Scilly Islands, connected with the shore some years ago by telegraph, proved a signal failure on account of turns being taken in and out of the wire through the swinging of the light-ship, and the same experience is being found with the wire leading to the light-ship on the Goodwin Sands.

With the attention of some of the brightest minds extant directed towards this feature, and the knowledge gained from the many tests made during the past few years, there ought surely to have been a succession of practical working devices brought to the notice of the several governments long before this. Up to the present time the only advance which has been made has been in protecting of the shore end of the connection, all difficulties at that end having been seemingly overcome, but the outlying or sea end still causes trouble and never ending anxiety, solely from the reason that the light-ships swing with the wind and tide and at every complete swing a full round turn is taken in or out of the cable. Further, the pitching of the vessel chafes the cable severely where it touches the ground, and, worst of all, fracture is most likely under heavy weather conditions when communication is most needed.

Great Britain has not been alone, however, in working towards a means of communication between light-ships. For two years past Prof. Lucien J. Blake, of the chair of electrical engineering at the Kansas State University, has been working on several theories, and has now almost succeeded on the lines of a telephone message system. The difficulty that has always confronted the electrician in his endeavors to connect a ship with the shore was to devise some mode of carrying the electric current from the end of a cable at the bottom of the sea to the deck of the ship. The ship riding at anchor is continually changing her position, and breaks any wire or cable that is fastened to her. To avoid this obstacle, as we have pointed out, all manner of schemes have been tried without success, and now the Kansas professor proposes making the anchor chain of the ship form the connecting link. The plan in brief, is to attach to the anchor another chain leading toward the shore for a sufficient distance so that neither the end of chain nor the water will be disturbed by the tossing of the ship, and there make his connection with the shore cable, and a connection on this principle was secured a few days ago between the Scotland light-ship and Sandy Hook, entrance to New York bay.

The experiments of Prof. Blake have now reached that stage where the government should take hold of the subject and thoroughly test the merits of the system. The value of such communication is beyond question. Heretofore the only way of getting word to and from outlying objects from the coast was, and perhaps still is, by boat, and in stormy weather communication is frequently entirely shut off. Some of these light-ships are the first to sight a disabled or inward bound vessel, and if the telephone or telegraphic communication is made possible, notice of arrival can be secured early and accurately.

Prof. Blake is further working upon a theory which he hopes to perfect, to make telephonic communication between two passing ships without the use of a connecting cable, using simply the water as a conductor, and he expects to eventually put in operation an automatic signal for working by electricity through the water so as to show the proximity of another ship on an indicator, and thus provide means for avoiding collisions, all of which is "a consummation devoutly to be wished."

ATTENTION is called to an article in this issue of THE RECORD on the channel system of ship construction. Especially is the subject pertinent, because at this time several lake shipyards are considering the merits and demerits of the new principles about being introduced in the entire construction of long steel ships.

AND now the rumor is that H. C. Frick will sever his connection with the Carnegie Steel Co. to enter Standard Oil Co. circles. Mr. Rockefeller, the Standard oil magnate, has a controlling interest in vast iron mines on the Mesaba range, the railroad from the mines to Duluth the large "whaleback" tonnage, and the shipyard that builds them. Production and transportation being in the hands of Mr. Rockefeller, he now wants the element of manufacture to round up his "sure thing." If such is the aim, Mr. H. C. Frick, who is a man of national reputation, at the head of an immense iron and steel manufacturing plant near to the iron mines, would ably complete a veritable Napoleonic project in the annals of the world industrial. This would be effected by combining on a large scale the three important functions of commerce, viz., mining, manufacturing and transportation on the most advanced principles known to each industry, and efficiently carried on under the most economical management.

## THE UNDERWRITERS' CHANNEL.

Given first-class material, good tools, careful fitters, expert riveters and experienced inspectors, a strong ship may be generally constructed of any form of bar commonly used in the internal construction of ships, but to quote a hackneyed phrase, I would say that the aim of all good shipbuilders and engineers is to secure "maximum of strength with minimum of weight," having at the same time due regard to financial economy of construction and efficiency in working.

Several years ago European shipbuilders adopted a section of iron or steel known as a channel bar, for the midship frames of ships, or rather for partial frames, as experienced shipbuilders and naval architects saw that such a section would require to be limited to the body of the vessel, and could not be used below the bilge or elsewhere in the construction of a good ship; moreover, none of our American or European classification registers appeared to sanction this kind of frame to any greater extent than the limit mentioned. Channel bars were adopted to that extent in the construction of the Campania and Lucania. There may have been several reasons for this precaution, one good reason no doubt being that the expense of repairing such ships would be very great, particularly as a ship might be detained in dry dock for an indefinite time while channel bars of a certain weight and section were being procured.

It now appears, however, that American ingenuity and enterprise is not to be deterred by any such considerations, genius having discovered an unlimited field, both on the outside and inside of a ship for the use of these bars.

Owners and builders, by dint of special pleading, were quickly found, both of whom were willing to pay the cost of the experiment on a very large scale. The question of close fitting and square riveting might cause carefully trained mechanics to hesitate in such matters, but patentees had to experiment, and with such a system there was nothing to prevent the shell being neatly finished outside, and as to the rivet heads, the probability was that the bad ones would never be seen. It has been shown in a general way, that an assemblage of plates or bars are preferable to individual plates or bars of large section; for instance, a ship's side covered by seven strakes of plating would not be so strong as if ten strakes of equal thickness were used with a proper shift of butts maintained.

Two angle bars will in a general way make a stronger stinger than one channel bar of the same weight, for in the former case the strength at the butt is made equal to half the total section even before a butt strap is fitted, and when such is fitted, the strength may be brought up almost to the solid section. This cannot be approached with the channel bar.

As a further illustration of what I mean, consider the planking of wooden ships, these resist longitudinal bending and other severe stresses without any straps connecting the butts of planking, this is solely because there are several solid planks between each butt. If an oak steamer's side could be covered by one or two broad planks a special butt connection would have to be devised to keep the hull together. The fact that the channel bar is not punched over its whole length for riveting is of little or no value with regard to strength, for it must be punched for some fastening at some portion of its length, and as no part of a beam or girder is stronger than its weakest section, there would seem to be no great advantage on that head. The most momentous question, however, has yet to be discussed, that is the riveting. Of course channel bars of small section cannot be riveted inside the flanges and it is very questionable if good riveting can be effected even with larger section of channel bars, the holder-on cannot see or get at the rivet heads properly, and when the flanges are tapered from the fillet to the edges a straight, square headed rivet cannot be riveted and in the effort to do so the rivets will, in most instances, be so severely bent over as to exceed their elastic limit, when channel bars are used to secure wood fenders it does not appear how they are to be made and kept water-tight and repairing will be very expensive, besides as I have stated there is certainly no advantage as regards strength.

I am very much of opinion that the indiscriminate use of any such bar, whilst not contributing to any general extra strength, will be actually more expensive in construction and will certainly not be the means of securing a light hull, for instance, it seems to be necessary to have channel intercostals connected to every tank girder to make up for the reduced depth of floors and to space the channel web frames unusually close together on account of their comparative narrowness.

It is generally admitted that the less packing the better in connection with riveted work, the channel construction, however, will require a larger amount of packing or liners than the ordinary construction, for instance the intercostals in way of outside strakes of plating will require liners all the way along. These remarks are applicable to the side intercostals as well as to the bottom.

There may be another reason for the elaborate intercostal arrangement and that is that the connection between the intercostal bars and the tank girders is not nearly so efficient as the connection between an ordinary intercostal plate and a tank girder would be.

Then the work connected with the fitting of eight intercostal keelsons nearly all fore and aft without mentioning the side intercostals will be enormous and I fear that the shipbuilders may have a disagreeable surprise in store for themselves both on account of the extra weight and cost of this peculiar construction not to mention possible future contingencies.

We are now looking towards certain channels which will eventually exalt our status amongst the maritime powers of the world, increase our commercial prosperity and add to our wealth by the construction of our own ships to convey our own products to the marts of the world.

Then let us remember that we are the same people who in years gone by sent forth the most speedy and at the same time the best constructed ships of the world and bearing in mind our former prestige and national traditions let it never be said that from the commercial centre of the United States emerged an unmechanically constructed ship, weakly connected, which may develop only into a channel for the dissipation of the owners' and underwriters' capital.

C. S. SEABURY.

NEW YORK, March 12, 1895.

## PEERING INTO THE NEAR FUTURE.

The outlook for the coming season has not been materially affected during the past week by any events in the way of sales of coal, ore or lumber, but at the same time the feeling is slightly more optimistic than it was seven days ago. The miners in the Pittsburg district, who have been out on a strike for about a week, are returning to work victorious, in that they succeeded in their demand for 69 cents per ton in mining coal. There was not much of a struggle, the operators quietly making the concession, one at a time. The feeling prevails that this rate is positively low enough, and with a 60-cent rate in Ohio, the prospect is that all danger of a strike in the spring has been obviated. In a few weeks some sales of lake coal may be looked for, although it is stated by the dealers that nothing very extensive is likely to be done before late in April.

The sales agents of the better grades of ore continue to hold occasional meetings for the sake of keeping track of each other, and of comparing notes upon any inquiries which may be made on ore for this season's delivery. So far as can be learned, what few sales are at the advanced rate, no resistance being made by the furnaces.

The Lake Michigan lumber industry is said to be in a bad way. Vessels which never, as a rule, leave that lake, are endeavoring to get into the trade between Lakes Huron and Erie. The business at the head of Lake Superior is thriving, large cuts being made, but whether much better prices are expected is doubtful. There have already been a few boats engaged for the Lake Superior trade, and from the Sault district and the lumber transactions for this season's transportation are probably further advanced than those of any other coarse cargoes.

Following close upon the Crescent Union line deal, the other package freight companies are getting to the front with their arrangements for the summer. The steamers W. H. Gilbert and W. H. Gratwick No. 2, as well as the Emily P. Weed, have been chartered by the Western Transit Co., on a pro rata basis, each of the chartered boats running the same chances as those taken by the company's own boats. The Gilbert and Gratwick were chartered in the same way last year, and not at any certain figure per ton, as has been reported. The vessel men, as a rule, prefer the per ton charter as settlements are reached sooner; but lake-and-rail freights are rather precarious, and the companies prefer to let the boats share the risks and the profits. The steamer I. W. Nicholas has, however, gone in on the old-style charter plan, and will receive 75 cents per ton. The five Crescent liners, by the way, were chartered by the Union Transit Co., for $27,500, or for $5,500 each per year. Manager French has since chartered two of the boats to the Clover Leaf line, operated by the Toledo, St. Louis & Kansas City for $10,000 each for next season, which has cleared the handsome profit of $9,000 already.

Early navigation on Lakes Michigan and Erie has not so far been very successful. The steamer E. A. Shores, chartered for four trips with grain from Chicago to Milwaukee, ran on Racine Reef last Saturday, and climbed five feet out on the rocks before she stopped. She was not released until Monday, when the tug Welcome got her off, after she had pumped a large quantity of grain overboard. She is probably seriously damaged, as she has only 5,000 bushels of wheat in fair condition. It is believed that neither boat nor grain were insured, and the loss will probably fall heavily on the owners. The steamer American Eagle broke her rudder last Monday when trying to continue her trips between Sandusky and the Islands. The steamer Petoskey has just been released at St. Joseph, Mich., after being tied up in the ice for two months. She will resume her trips to Milwaukee, but as a cold wave is announced, there is no telling how long she will be able to keep it up. Other package freight liners on Lake Michigan, and the car ferries, are said to be working very satisfactorily now, but taking into consideration the loss of the Chicora, winter navigation has received a number of set-backs this season.

There is nothing especially encouraging in the grain outlook, unless it is that there will probably be more corn to be shipped from Chicago and Toledo than has been estimated. Charters at Chicago are now being made at 1⅜c on wheat and 1¼c on corn to Buffalo, and 2¾c on corn to Kingston. Several Kingston charters have been made at Duluth during the past week at 3½c, and it is thought the rate will remain for some time at this figure.

## NEW CAR FERRY BARGES.

Captain James Davidson, of West Bay City, has secured the contract for the two car ferry barges which the Wisconsin & Michigan Railroad Co. is going to put in service on Lake Michigan between Peshtigo, Wis., and Frankfort, Mich. They will be 316 feet in length overall, with 44 feet beam, and 20½ feet molded depth. Each barge will have four tracks with a capacity of six cars each, thus being able to transfer a train of 24 cars. Besides other modern improvements, each boat will have a powerful deck engine and large boiler for working the pumps, windlass and capstans. A steel cable 200 fathoms long will be used, and this will be reeled in at the bow by the patent towing machine manufactured by the American Ship Windlass Co., Providence, R. I.

## CANADIANS AWAKENING.

Now, that a clean 14-feet draft is in sight through the St. Lawrence system of canals, Canadians are awakening to their transportation facilities. The C. P. R. is having a side-wheel steamer built on the Clyde for the route between Owen Sound and the Sault. She is to have a speed of 22 miles an hour. The Thousand Island Steamboat Co., Kingston, is having built at Philadelphia a 20-knot side-wheeler to cost $85,000. The King Ben, a new steamer, has just been launched at Kingston, for the Oswego, Kingston and Ottawa route; her dimensions are 111 feet long, 22 feet beam, 8 feet 6 inches depth of hold. The Ottawa River Navigation Co., are having built at Ottawa a steel steamer 158 feet on keel and 27 feet beam. A site is being selected at Midland, Ont., for a new dry dock to be 400 feet in length, 50 feet wide and 16 feet in depth.

## BOOKS AND PERIODICALS RECEIVED.

February number of *The Mariner*. An international review of shipping, marine engineering and kindred subjects published at 19 Buckingham street, Strand, London, W. C. is fully up to the usually interesting issues of this valuable illustrated journal and able exponent of marine industries.

* * *

*The Shipping World and Herald of Commerce*, Effingham House, Arundel street, London, W. C., edited by Major Jones, M. P., furnishes for March, besides its usual current notes by the editor, articles on the rule of the road, the design, construction and maintenance of a marine boiler, bronze propeller wheels, and a gist of technical matter which all interested in marine affairs would do well to take aboard.

* * *

*Fairplay*, London. Well! the inimitable needs no further say so. The look-out man on that journal lays over nearly all that we've ever come across, nothing in marine circles seems to escape the watchful eye of that blessed look-out and his facile pen runs riot weekly—withal he is an honest servant of the maritime world and a foemen worthy of any journalistic steel as yet manufactured. *Fairplay* is a daisy.

* * *

*Transport*, a weekly review of railways and canals, docks and harbors, shipping and shipbuilding, published at 35 Parliament street, London, S. W., is kept fully up to the tenor of its title and the issue of March 1st is a fairly representative number of this excellent periodical which it is our pleasure to find regularly on our exchange table always bright, crisp and up to date on all matters concerning transportation and shipbuilding throughout the world.

* * *

*The Steamship*, a scientific journal of marine engineering, shipbuilding and shipping, Leith, Scotland, is a monthly edited by John Lockie, C. E., Whitworth Scholar, and one of the best exchanges that comes to our table. The March issue, "Induced Draught," "Statical Stability in Ships," "The Screw Propeller," "Governor for Marine Engines," "Mechanical and Electrical Regulation of Steam Engines," with many other subjects of vital and commercial importance to the maritime world.

* * *

The Mercantile Marine Service Association *Reporter*, Liverpool, is a quarterly which to all engaged in active sailing must find perfection. The pages of the *Reporter* are always found teeming with subjects of modern requirements and an advocacy for the adoption of those principles which leads us on to the higher technical life, championing the cause of its members, making wise provision for widows and orphans, as well as the incapacitated seamen. The *Reporter* is worthy of the niche of journalistic fame which it so worthily fills.

* * *

*Shipping*, 21 Bevis Marks, London, E. C., is soaring away to the foreground of nautical monthlies. Though it is young yet there is certainly a hand at the helm or quill that is a driver, a rip-roarer though ever in good season and to the point on all questions concerning the shipping community. More linen has been spread in the March issue to the tune of eight pages, and more power to the little Hercules whom we are sure will soon reach the steady trade-winds of journalistic prosperity.

* * *

*The Engineers' Gazette*, 4 Pilgrim Street, London, E. C., contains in its February number a leading article on "triple screw propulsion" in which credit is given to the United States for having the fastest triple screw naval vessel afloat. The *Gazette* has also a serial on the "British Corporation for the survey and registry of shipping," an article on welded steel steam pipes, "the design and efficiency of plant for the transmission of power by electricity" as well as treating of other technical subjects.

* * *

The March Pilot Chart of the North Atlantic Ocean stands prominent as usual in its information to all who sail or who may have interest in the transportation of commerce between Lat. 60° N. and the Equator. The Hydrographic Department U. S. N. may be complimented on the valuable delineation which is got out every month at that office and if it were possible for Charles D. Sigsbee, Commander U. S. N. to make this publication more valuable than his predecessor in the Hydrographic department, we should say that he has reached that stage.

* * *

C. M. E. A. Annual, 1895, is the title of a finely bound brochure laid on our exchange table this week, from which it is learned that the Canadian Marine Engineers' Association was first organized at St. Catherine's in 1868. The present association was formed in 1883, and has several branches throughout the Dominion. O. P. St. John, president of the association, who compiled the publication, is to be congratulated on compiling and presenting to his brother craftsmen a valuable handbook and guide, yet he modestly asserts that the next will be a better one. Well! we think that it will be difficult to improve upon the 1895 edition.

Vol. VII., No. 1, of the *Journal of the American Society of Naval Engineers*, published quarterly by the society, is fully up to the standard of former issues of this valuable journal. The February number contains articles on modern marine engines, boilers, etc.; contract trial of the U. S. armored cruiser Maine, water tube boilers, air pumps, and notes on the construction of war-ships, merchant steamers, yachts and other interesting data. A list of the officers and members of the American Society of naval engineers are also given in the current volume.

* * *

The illustrated catalogue and price list for 1895, issued by the Goulds Manufacturing Co., Seneca Falls, N. Y., and 16 Murray street, New York, is the thirty-fifth edition of a work containing everything on pumps. This universally known firm was established in 1848, and from a moderate plant it has now grown to an immense manufactory turning out a product which is held in repute the world over. Pumps and hydraulic machinery for every service is a terse explanation of the contents of the cloth-bound volume containing 365 pages now before us.

* * *

Secretary William Thurstone, of the Buffalo Merchants' Exchange has issued his annual report for 1894, which as usual includes most valuable statistics of the trade and commerce of Buffalo. It is a book of 156 pages of information of value and interest to all who take pride or interest in the development of the ports on the Great Lakes and more especially of that of the Queen City, the manner in which it is compiled, its completeness and accuracy, are monuments to Mr. Thurstone's industry and efficiency, who by the way has been the Secretary of the Exchange for a number of years and we hope is likely to remain so for at least another decade. This is the least we can say in calling attention to Mr. Thurstone's work during the past year.

* * *

*The Nautical Magazine and Journal of the Royal Naval Reserve*, published by Pewtress & Co., 28 Little Queen street, London, W. C., is the oldest and also one of the most reliable monthly journals which it is our pleasure to peruse. *The Nautical* was established in 1832, and has always maintained a high standard of excellence, inasmuch if you see it in *The Nautical*, "It is true." If we pass over the "Notes on Current Events," which are always highly instructive, the March number contains articles on "Lifeboats," "Shipping Law," "Screening of Side-Lights," "How to Find the Stars for Observations at Sea," "The Deflection of the Magnetic Needle," and other articles which to enumerate would occupy too much of our space at this time. However, we now as heretofore recognize in *The Nautical* one of the best exponents of marine lore and this too from the numerous standpoints interested therein.

* * *

During March a series of articles, dealing with subjects that primarily concern the people of California, but that are destined to arouse interest throughout the country at large, will be published in *Harper's Weekly*. The first of these articles is entitled *California's Great Grievance;* the second is devoted to the subject of reform in San Francisco, and a third to the production of gold. Their author is Julian Ralph, the famous correspondent, whose investigations have been conducted at the request of the *Weekly*. Another series of the first importance, the publication of which has just commenced, will contain the instructive results of a tour of the world, undertaken by the Transportation Commision of the Field Columbian Museum, for the purpose of collecting information, and, as far as possible, exhibits. This Commission will not confine its attention to railways, but will embrace within the scope of its investigation the appliances both by sea and land by which men in all countries, and and on all the waterways of the world, have attempted to solve the question of transportation.

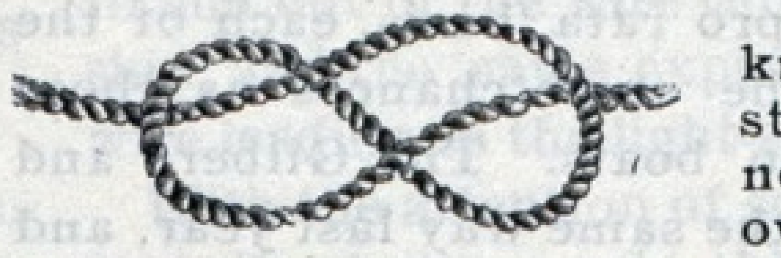
* * *

The proceedings of the National Convention of Manufacturers, held last month in Cincinnati, O., should be in the hands of all commercial bodies. We especially call attention to the following resolutions which were unanimously passed by the convention: "Believing that ships sailing under the flag of the United States should carry our entire maritime commerce, and in view of the injury thereto by subsidized foreign shipping, we declare in favor of a judicious system of subsidies in order to the complete restoration and extension of our merchant marine." "The Nicaragua canal being essential to the commerce of the United States, and of national importance, we favor its construction and operation under the control of the Federal government." "Our natural and artificial waterways should be improved and extended by the Federal government to the full needs of commerce, connecting the Great Lakes with the rivers of the Mississippi Valley and the Atlantic seaboard." The foregoing has the true ring and means that our people are awakening to the situation which confronts the country relative to the best transportation interests.

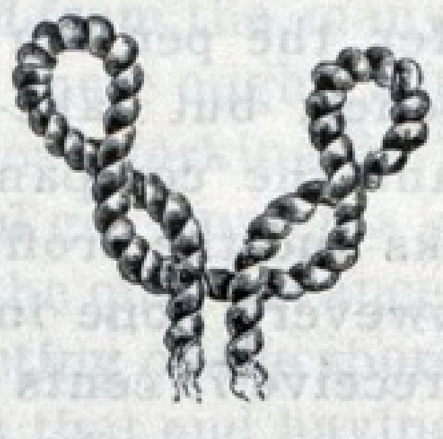
THE Cramp Ship & Engine Building Co., has contracted to build for an unnamed owner a 20-knot steel steam yacht, which in design and finish will not be surpassed by any pleasure craft afloat.

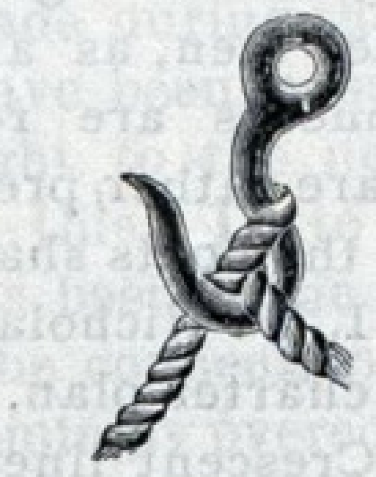
## KNOTS, BENDS AND HITCHES.

There are a large number of knots and bends in daily use aboard of a vessel, which the young seaman endeavors to become acquainted with in the earliest stages of his experience. A number of these knots and bends are shown in the following cuts, which, if looked at closely will allow any of the younger members of the fraternity, yachtsmen and others to learn their formation, after a little practice.



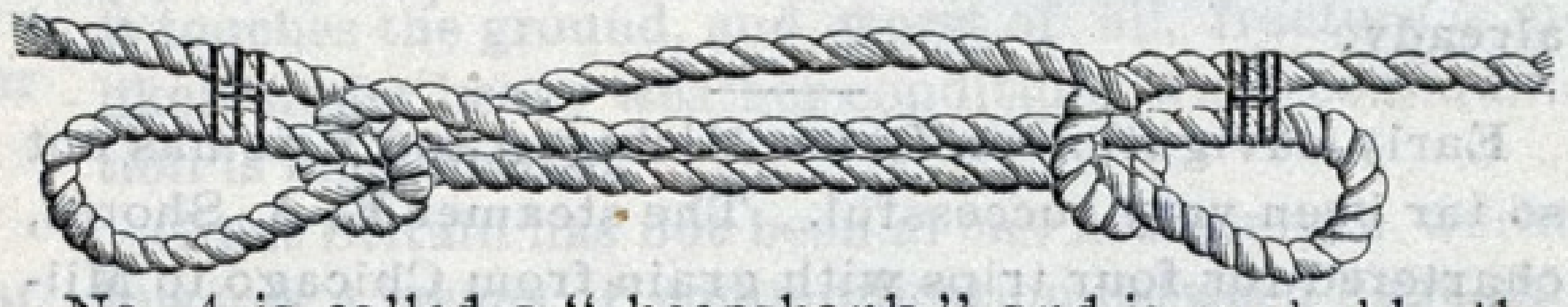
No. 1 is a "figure of eight" knot used frequently as a stopper knot on account of it not jamming, as a simple over-hand knot would do when a strain was brought on it.



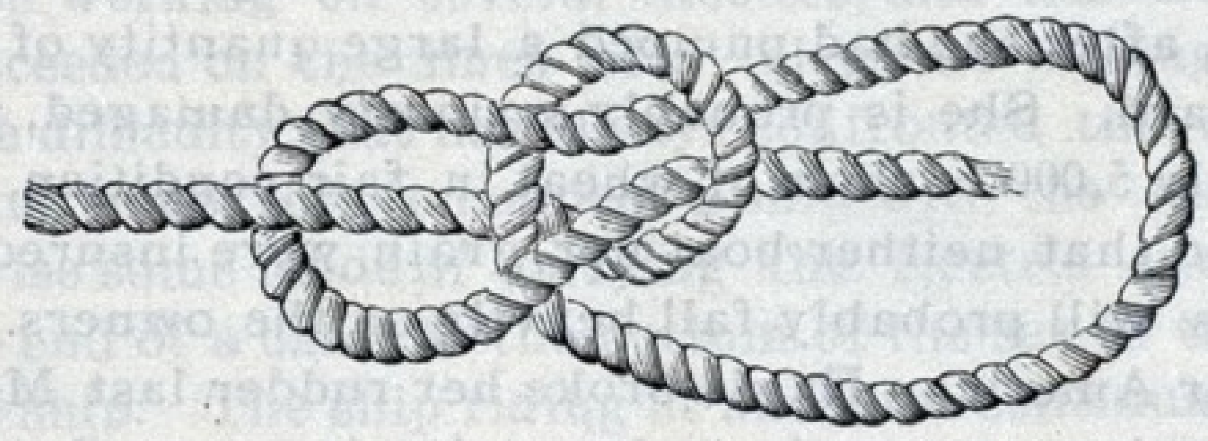


No. 2 is a "cats-paw," used to shorten a strop or slings and for similar purposes.

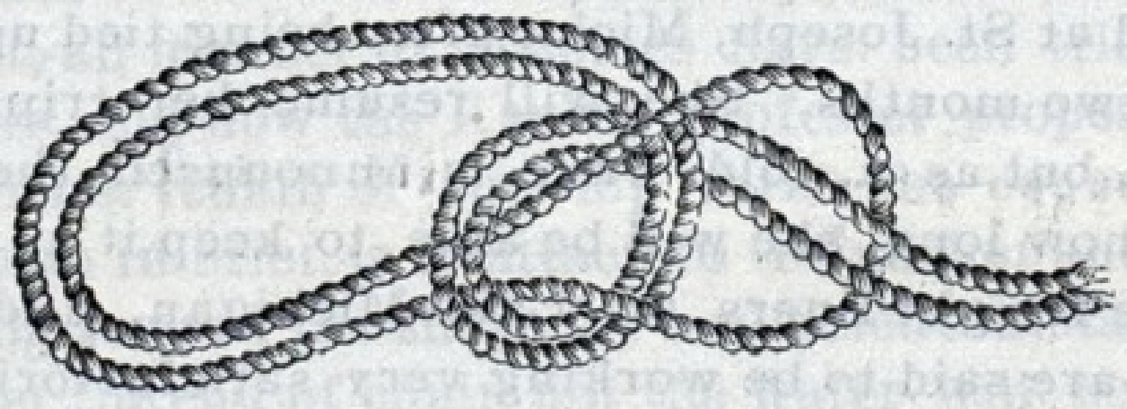
No. 3 is the well-known "black wall" hitch and is used to hitch the end or bight of a rope round the neck of a single hook, the end or hauling part being of course, underneath.



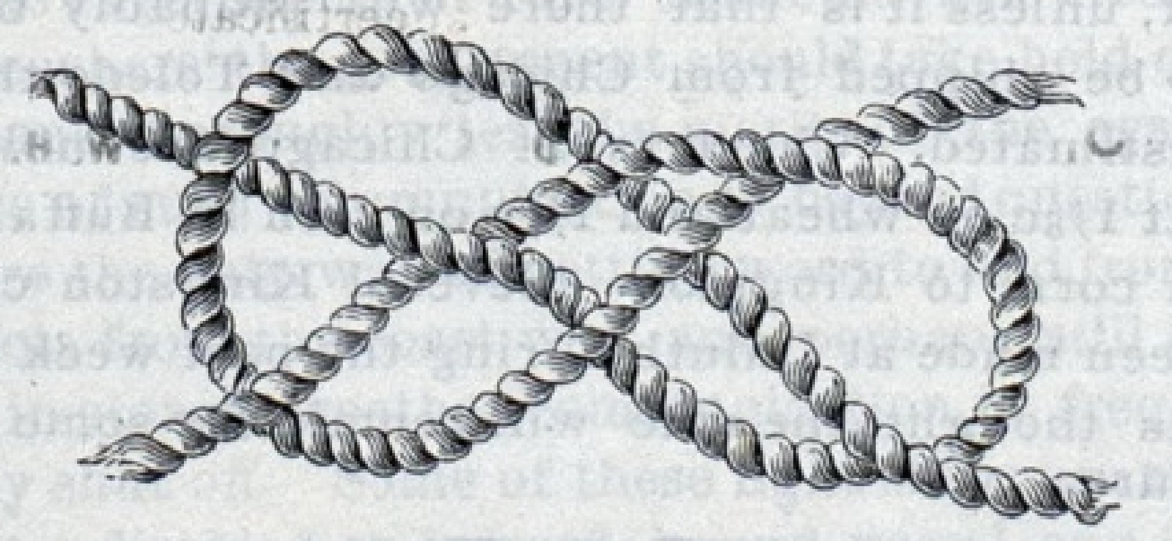
No. 4 is called a "sheepshank," and is probably the best means known for temporarily shortening up a single rope. To make it secure and neat it is necessary to stop the bights back to the standing part.



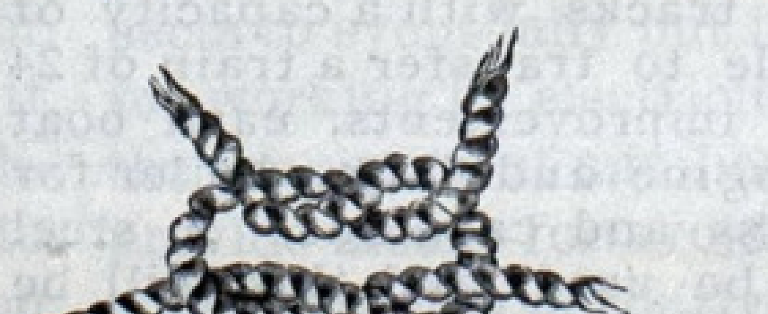
No. 5 is a "standing bowline," one of the most useful and trustworthy bends known to the seaman.

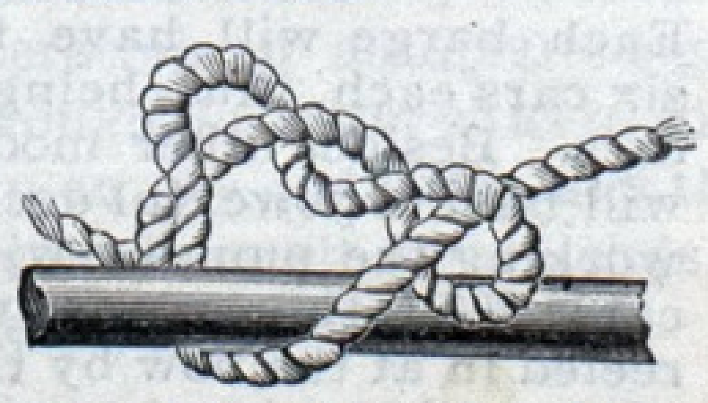


No. 6 is a "bowline on the bight," which is formed somewhat differently from the standing or running bowline, and while it is not in so much use or importance as the standing bowline, it has its special uses and no seaman can afford to be in ignorance of the manner in which it is formed.

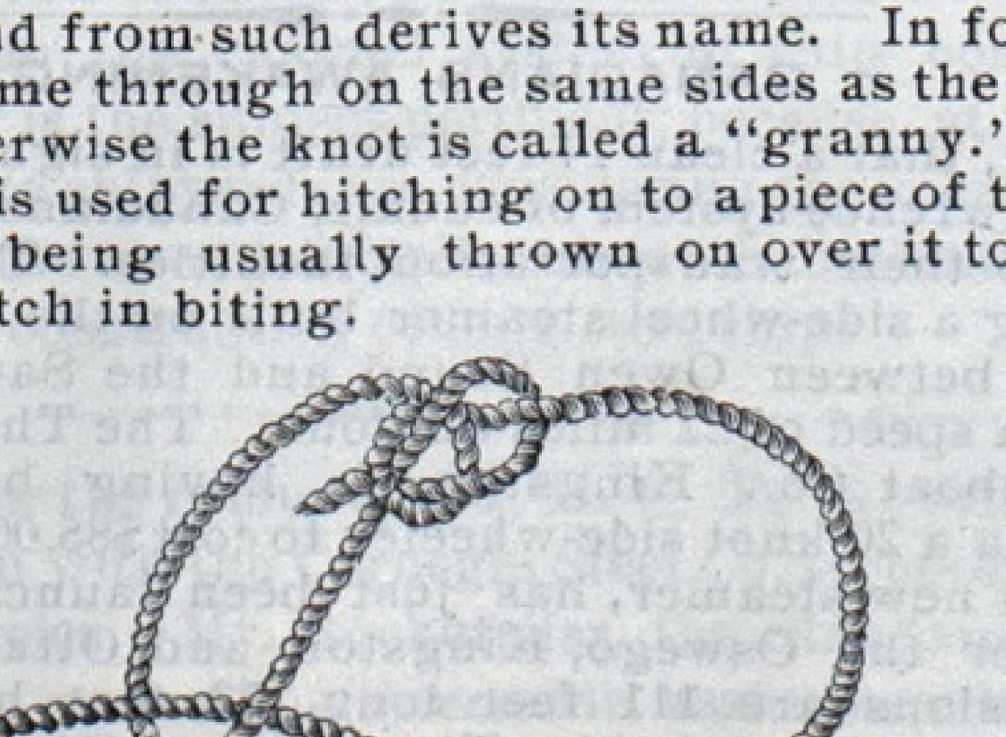


No. 7 is a "carrick bend," the only bend used for joining two ends of a hawser together. In the event of a towing hawser or any rope of large size parting there is no bend known which will give the service and be so easily cast adrift again as the carrick bend. It will never jam, and with the ends stopped back it is perhaps the kindest bend which can be put into a hawser. It is frequently, though wrongfully, called a hurricane bend.





No. 8 and 9 are respectively a "reef knot" and a "timber hitch." The former is in exclusive use for tying reef points and from such derives its name. In forming it the ends come through on the same sides as the standing part, otherwise the knot is called a "granny." The timber hitch is used for hitching on to a piece of timber, a half hitch being usually thrown on over it to assist the timber hitch in biting.

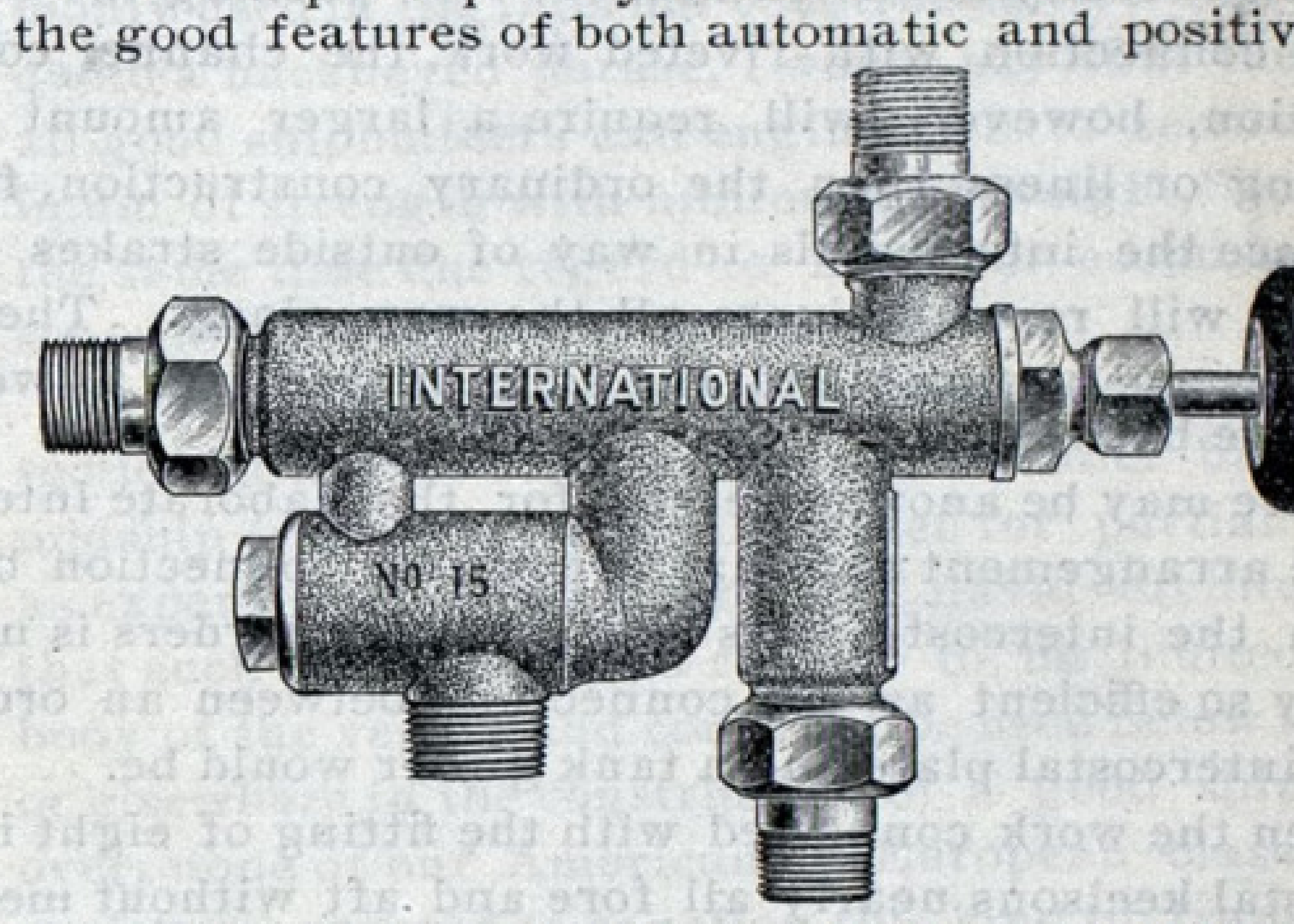


No. 10 shows the formation of a "running bowline," it being an ordinary bowline formed around the standing part, thus allowing it to become a running noose or slip knot.

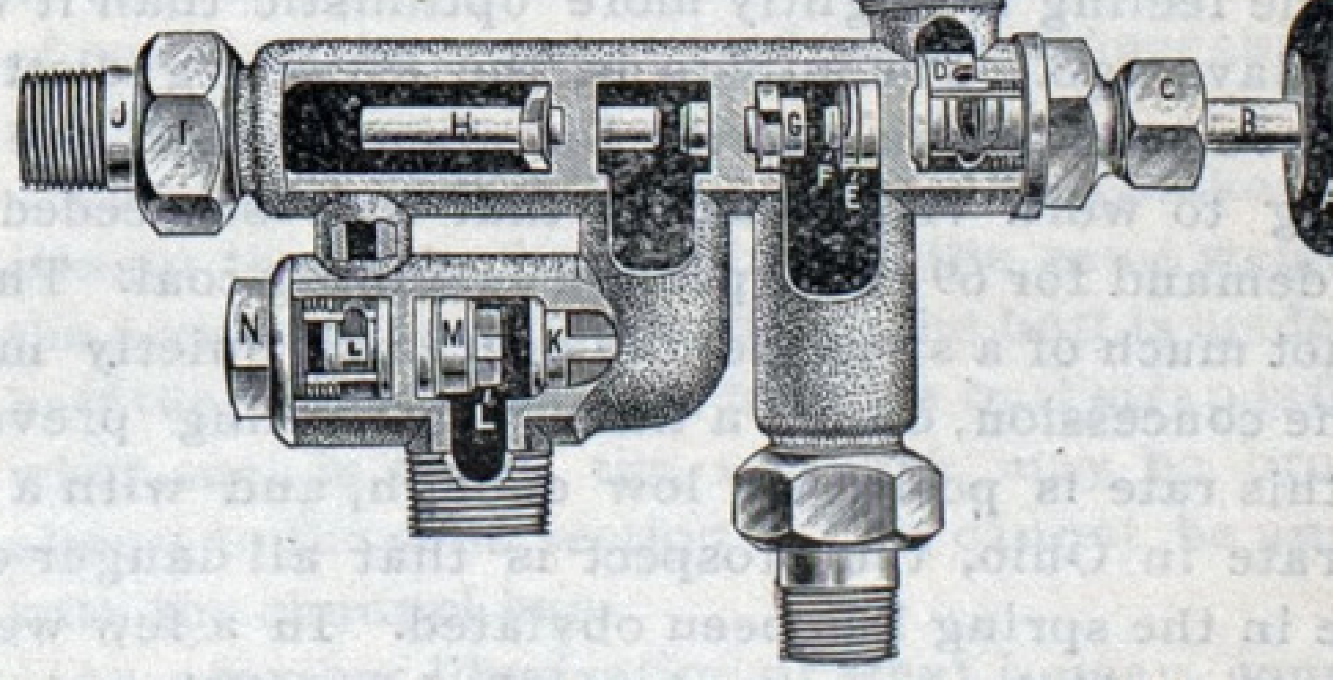
## A PATENT INJECTOR.

(ILLUSTRATED.)

We illustrate herewith a new injector, for which the makers claim most remarkable and wonderful results. During the past few years a great number of automatic injectors have been put on the market, but in the main features and methods of operation, they have in a great measure copied one another, and none of them have been able to produce better results than others which have gone before. Up to the present time automatic injectors have been limited in their range, as it has always been found impossible to retain the automatic qualities and at the same time handle a hot water supply, or give the injector a greater range than 120 to 130 pounds between highest and lowest steam pressures. The positive injector reached its limit 15 years ago, and while it has secured better results on hot water than the automatic injectors, yet a first-class positive injector is high priced and requires considerable attention from the operator.



The International injector is a new departure, being based on new principles by virtue of which it combines all the good features of both automatic and positive injectors of the past, and surpasses both in working qualities. The principal new feature in the International is the fact that the current of water to the boiler is established against atmospheric pressure instead of against direct boiler pressure as heretofore. This is accomplished by the combination of overflow valve K and pressure valve L. When the injector starts, the steam passing through the steam jet F and suction jet G, passes down through the overflow chamber, forcing valve K and L away from their seats and opening the passageway through the overflow for the escape of steam, which by its pressure against the valve H holds both valves away from their seats. A vacuum being created between jets F and G, the water is lifted, and passing through the suction jet G and combining and delivery jet H, on its way to the boiler, passes down through the secondary overflow, and out through the passageways between pressure valve L and pressure valve collar M. As the pressure increases in the delivery chamber around the delivery jet H, valve L is gradually forced to its seat against the collar M, but does not finally close until the current to the boiler is firmly established. The valve K in the meantime is closed by the vacuum in the overflow chamber. By a new construction of the parts in the steam chamber, the same valve handle A opens valve admitting steam to the injector, and at the same time regulates the amount of water supply, therefore, no valve is required in the suction pipe, nor is one necessary in the steam pipe, except as a convenience should it be desired to remove the injector at any time while carrying steam on the boiler.



Another new feature is the fact that the combination and delivery jet H has no spill holes, and will therefore outwear three of any other make. The makers claim for this injector that it will start at 13 to 15 pounds steam pressure, and work from that point up to 250 pounds, which is 100 pounds greater than any other automatic injector. It is automatic and re-starting at any and all pressures. It lifts the water vertically 20 to 22 feet, and handles a hot water supply of 135 degrees at 65 to 80 pounds of steam; 125 degrees at 125 pounds of steam. By delivering the minimum capacity, it will put water into the boiler at 200 degrees at 80 pounds steam, and at 260 degrees at 150 to 200 pounds of steam, the water being taken from a 4 foot lift at 74 degrees. One of the most remarkable features about this injector is its grading capacity. The best injectors heretofore manufactured have a grading capacity of only about 40 to 50 per cent. while the minimum capacity of the International is 66⅔ less than the maximum capacity of the same size. The parts are made interchangeable, and are all easily accessible for cleaning, and the injector is fully guaranteed. It is manufactured by the World Specialty Co., of Detroit, Mich., who will be pleased to send descriptive circulars and price list to any one inquiring for same.

WILLIAM L. BROWN, President.
WALTER F. COBB, Vice President and Treasurer.
W. I. BABCOCK, Manager.
O. R. SINCLAIR, Secretary and Asst. Treas.

# Chicago Ship Building Company,

**STEEL SHIPBUILDERS and DRY DOCK PROPRIETORS,**

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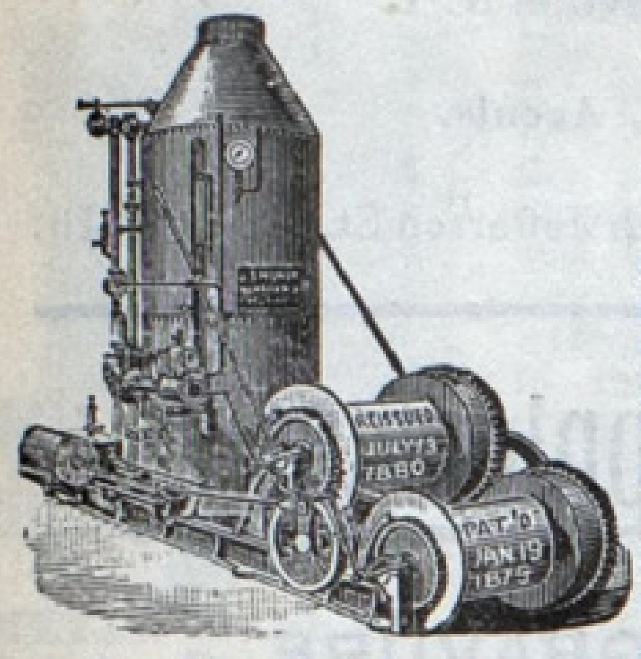

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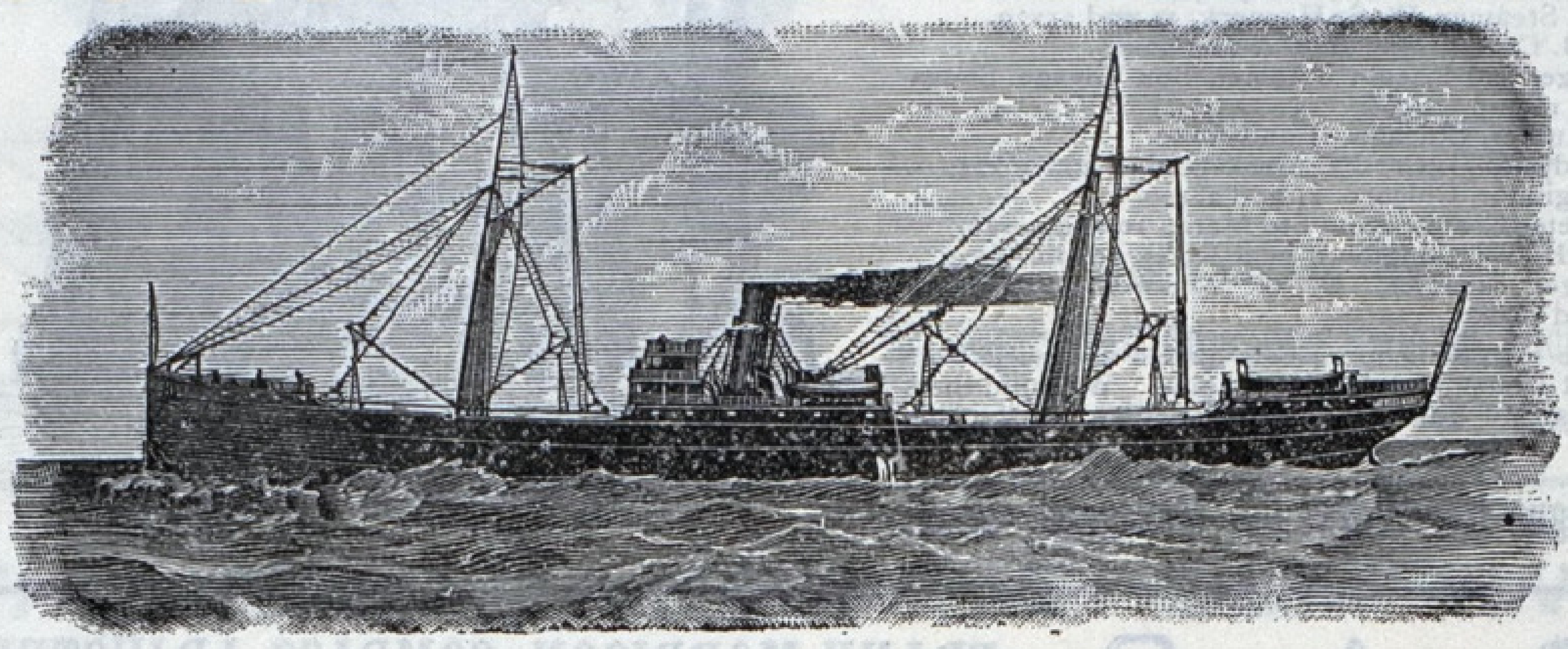

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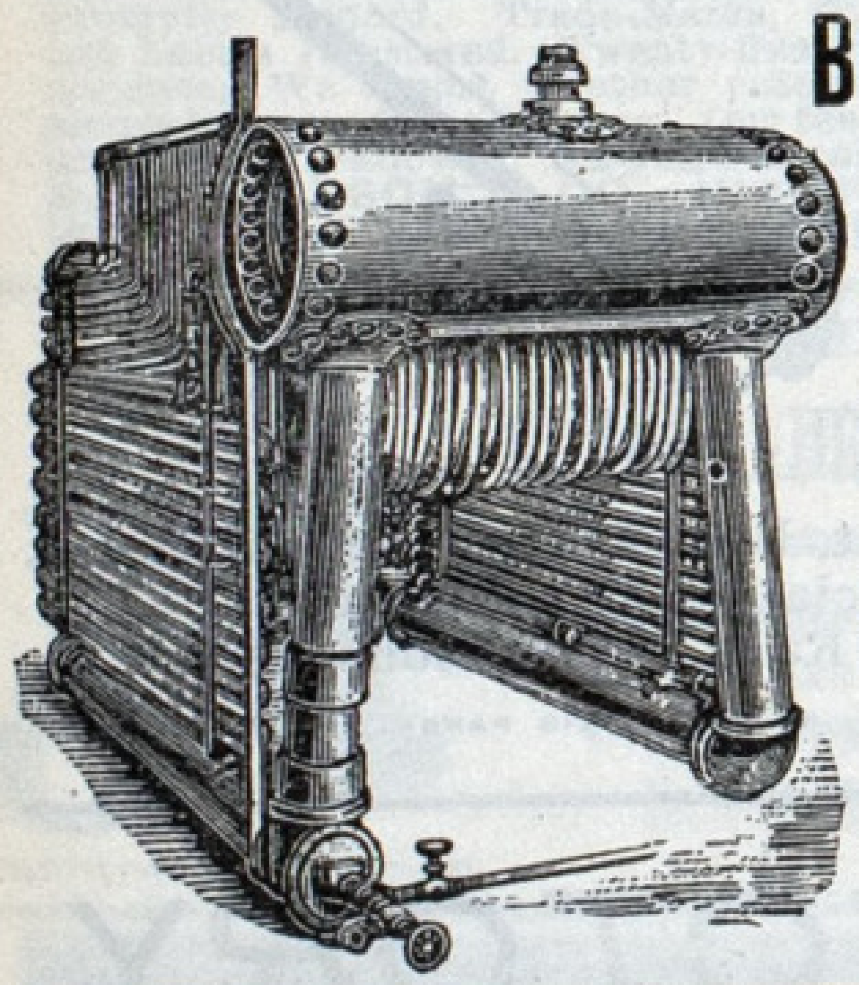

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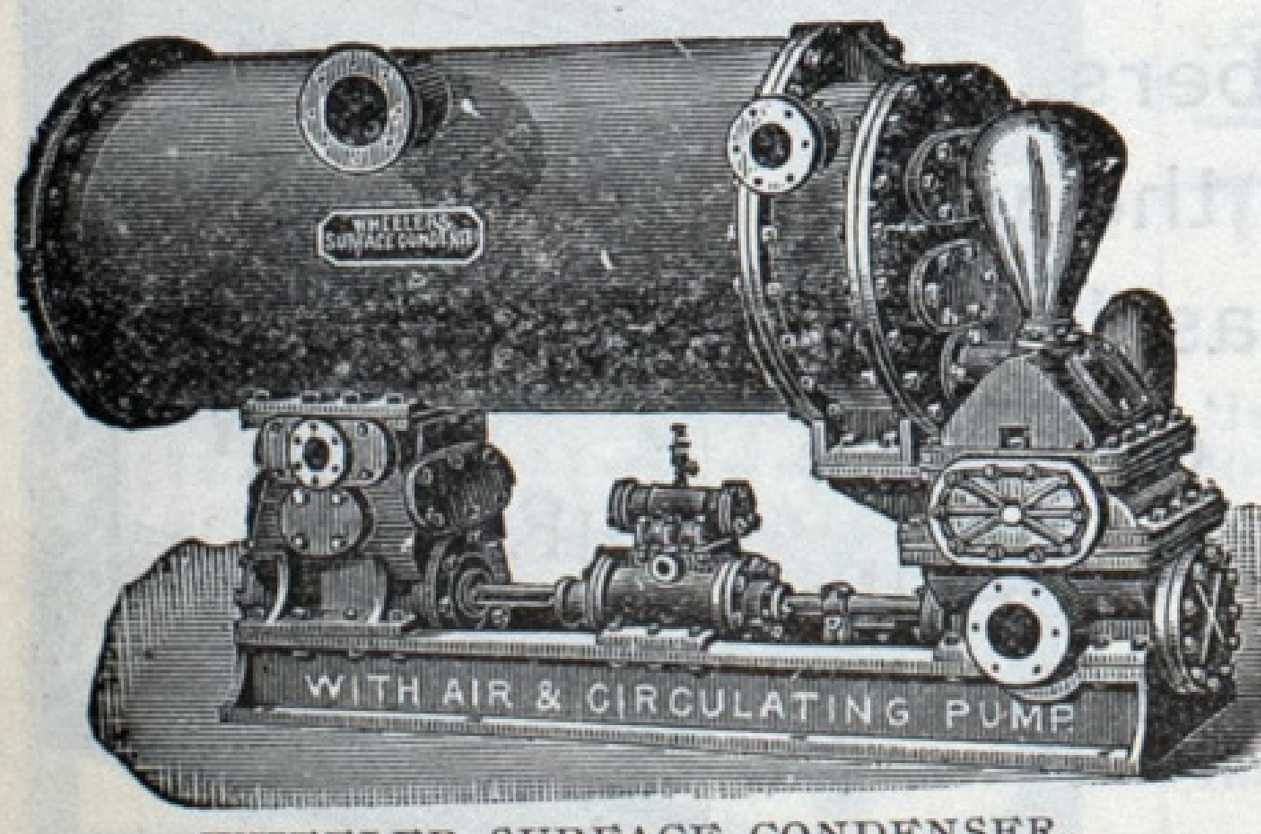

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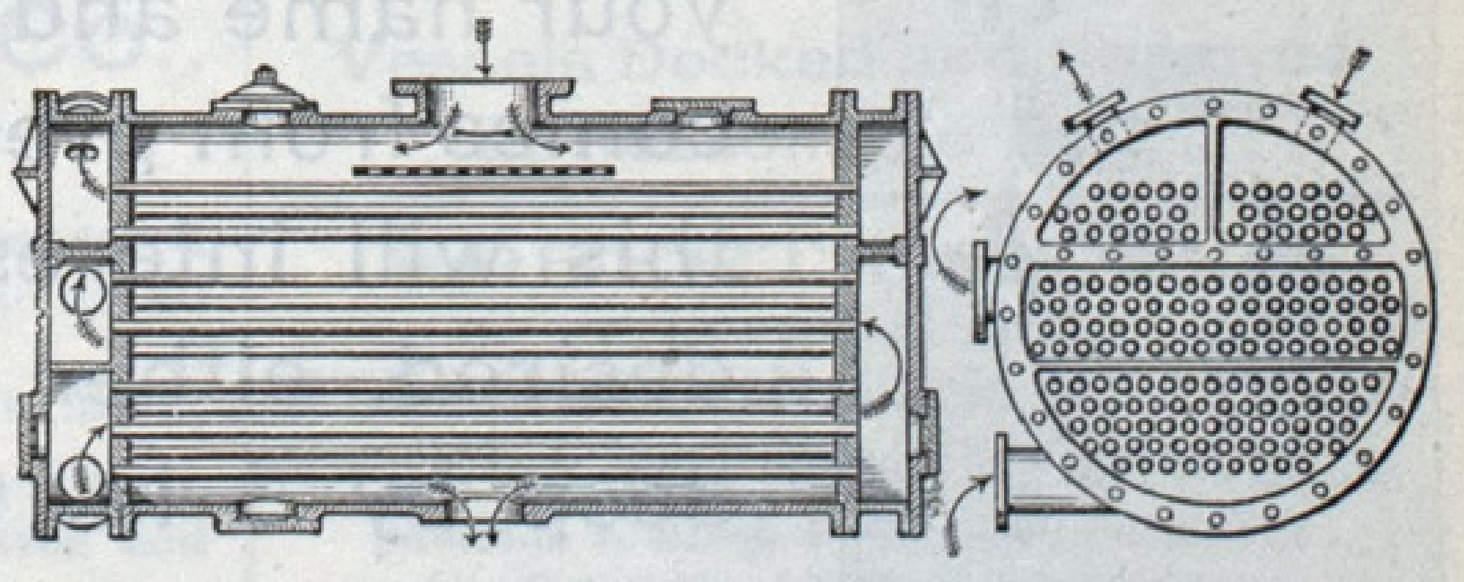

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## PROPOSALS.

U. S. Engineer Office, 157 Ottawa St., Grand Rapids, Mich., March 5, 1895. Sealed proposals will be received here until 12 o'clock noon, April 4, 1895, and then publicly opened, for Breakwater construction at Petoskey, Mich., and for Pier extensions at Frankfort Harbor, Mich. Specifications furnished on application to G. J. Lydecker, Lt. Col. Engrs. 10–13

U. S. Engineer Office, Newport, R. I. February 9, 1895. Sealed proposals, in triplicate, for dredging on Green Jacket Shoal, Providence Harbor, R. I., in Taunton River, and in Hyannis, Edgartown and New Bedford Harbors, and Canapitsit Channel, Mass., and for removing ledge rock in Pawtucket River, R. I., will be received here until 12 o'clock, noon, March 20, 1895, and then opened. Full information furnished on application. W. H. Bixby, Capt., Corps of Engineers, U. S. A. 8–11

Treasury Department, Washington, D. C., February 26, 1895. Sealed proposals for building a steam launch, to be named "Tybee," for the Revenue Cutter Service, will be received at this Department until 2 o'clock p. m., Wednesday, March 20, 1895. Bids must be in accordance with the instructions accompanying the specifications, be addressed to the Secretary of the Treasury, and be endorsed on the envelope, "Proposal for building a steam launch for the Revenue Cutter Service." Specifications and plans for the work will be furnished to parties desiring to submit bids upon application to this Department. The right is reserved to reject any or all bids and to waive defects if deemed for the interest of the Government so to do. C. S. Hamlin, Acting Secretary. 10–11

U. S. Engineer Office, Hickox Building, 185 Euclid Avenue, Cleveland, O., February 15, 1895. Sealed proposals for Cutting an Opening in Shore Arm of West Breakwater, at Cleveland Harbor, Ohio, will be received here until 2 o'clock p. m., standard time, Friday, March 15, 1895, and then publicly opened. All information furnished on application to Jared A. Smith, Lt. Col., Engrs. 10–11

U. S. Engineer's Office, Duluth, Minn., March 1, 1895. Sealed proposals for repair work to revetment at upper entrance, Portage Lake Ship Canals, Mich., will be received here until 12 m., April 1, 1895, and then publicly opened. Further information furnished here or at branch office, Houghton, Michigan. Clinton B. Sears, Major, Engineers.

Office of Light-House Board, Washington, D. C., March 11, 1895. Sealed proposals will be received at this office until 2 o'clock p. m., on Thursday, the 11th day of April, 1895, for furnishing the materials and labor of all kinds necessary for the construction and delivery of one first-class composite Light-Vessel No. 66 for a fixed sum for said vessel delivered. Forms of proposal, plans and specifications, showing what is required, can be had or seen by applying to this office. The right is reserved to reject any or all bids and to waive any defects. John G. Walker, Rear-Admiral, U.S.N., Chairman. 11–12

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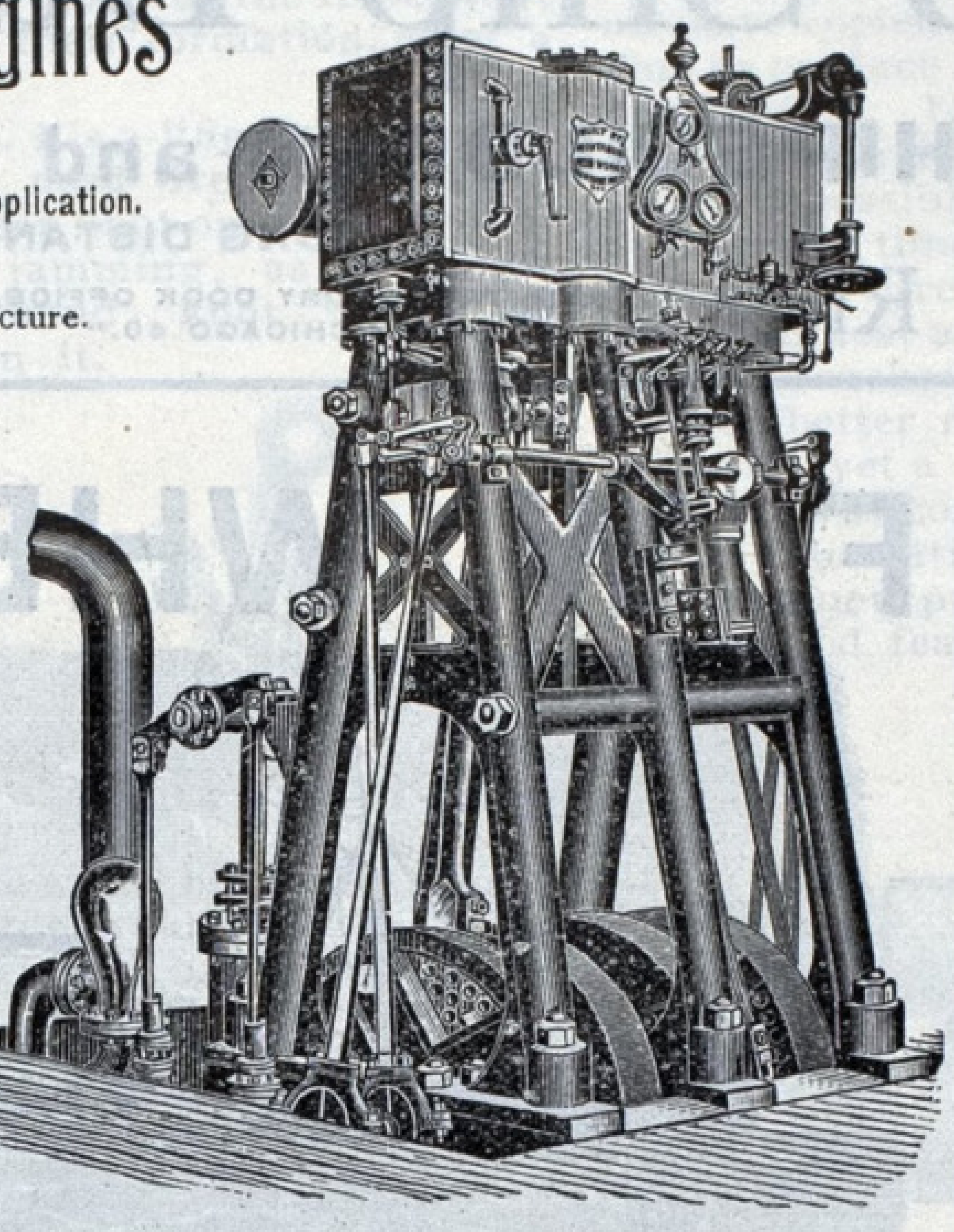

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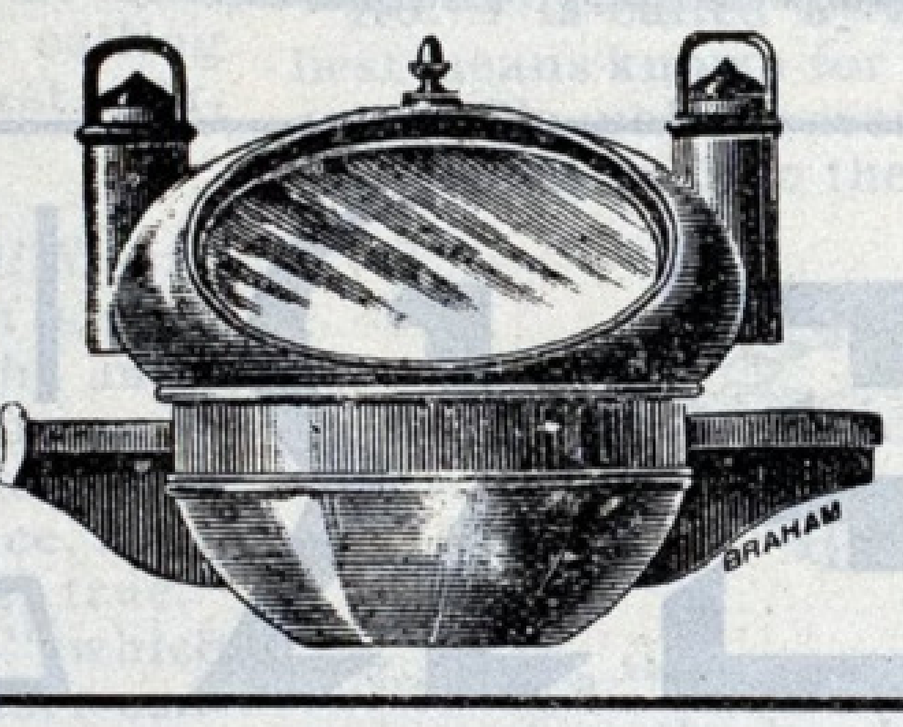

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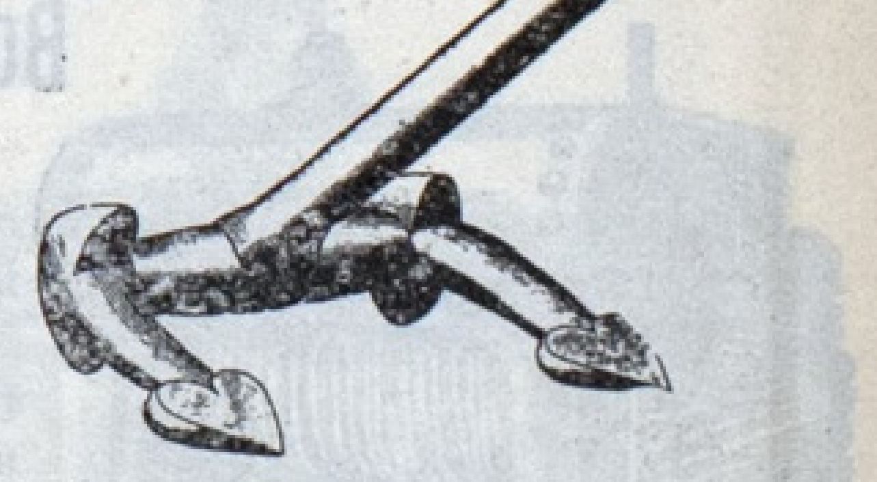

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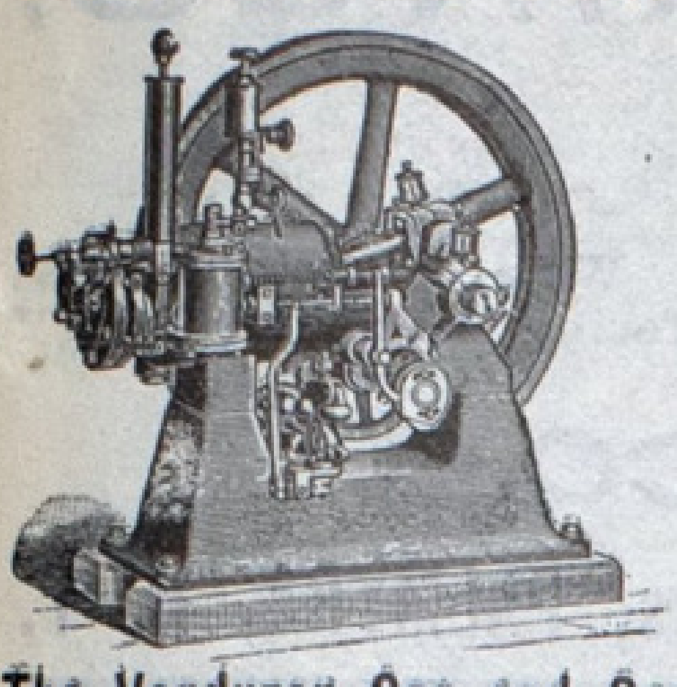

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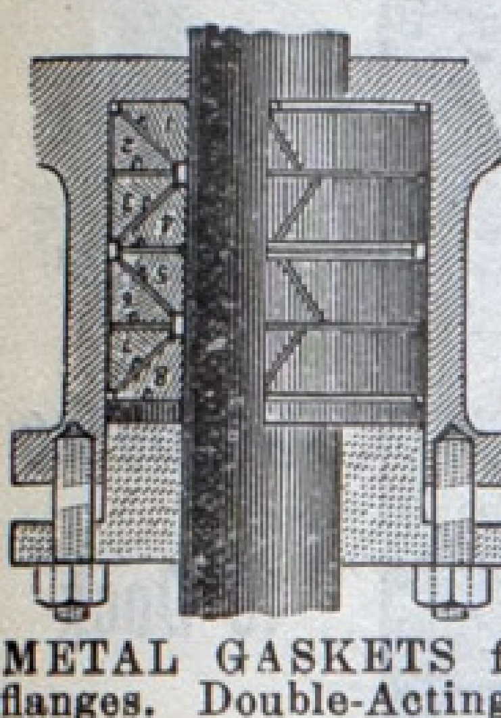

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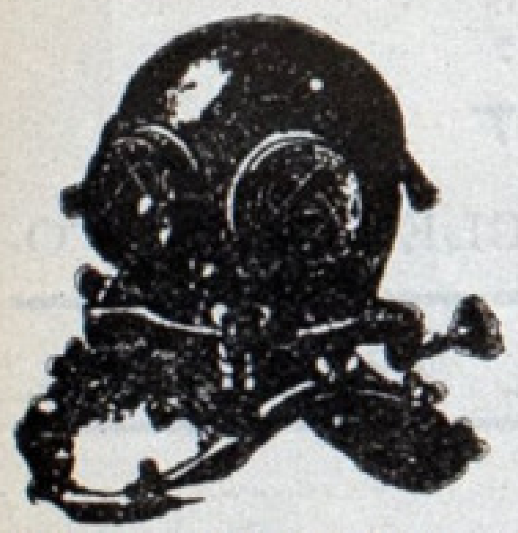

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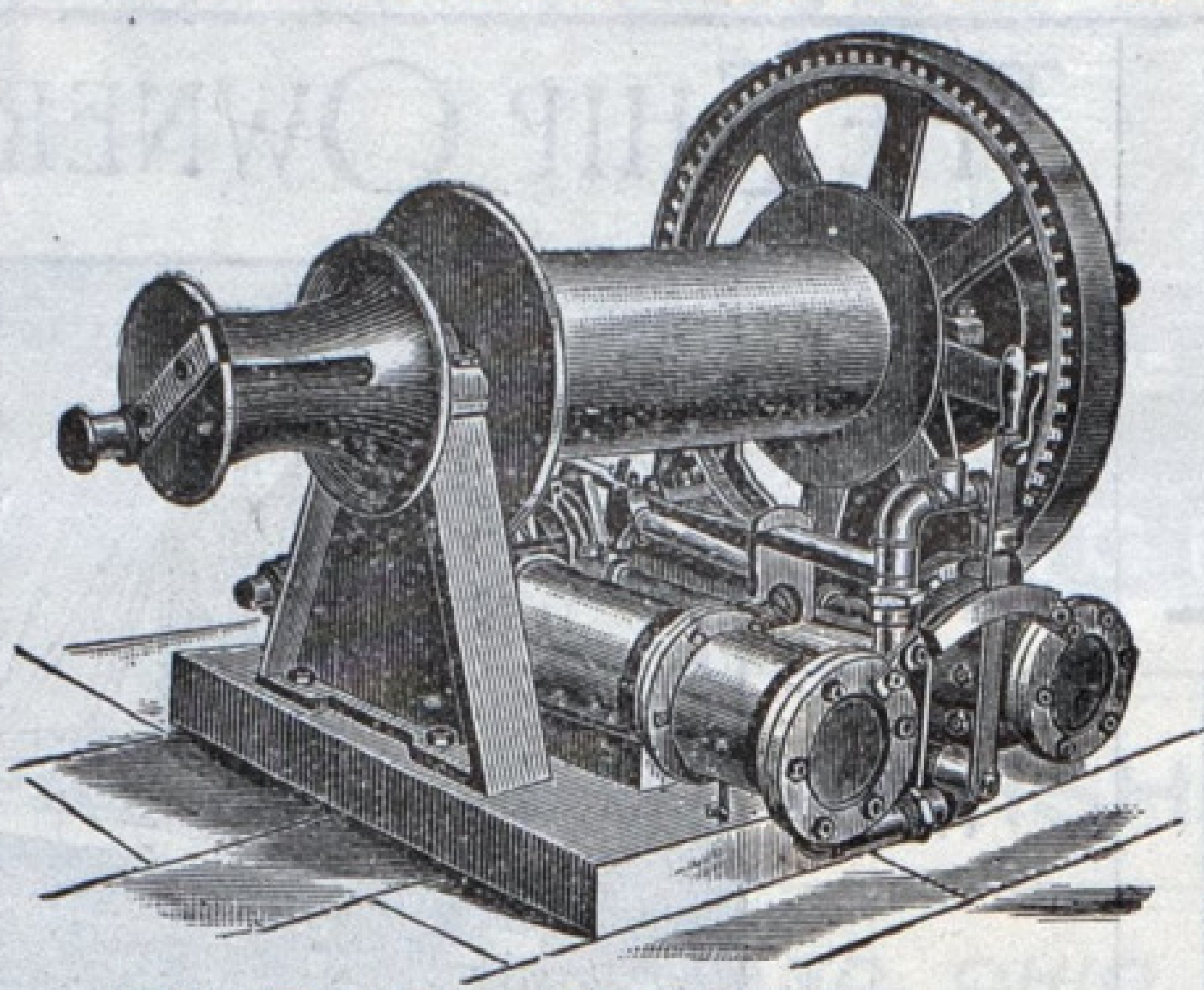

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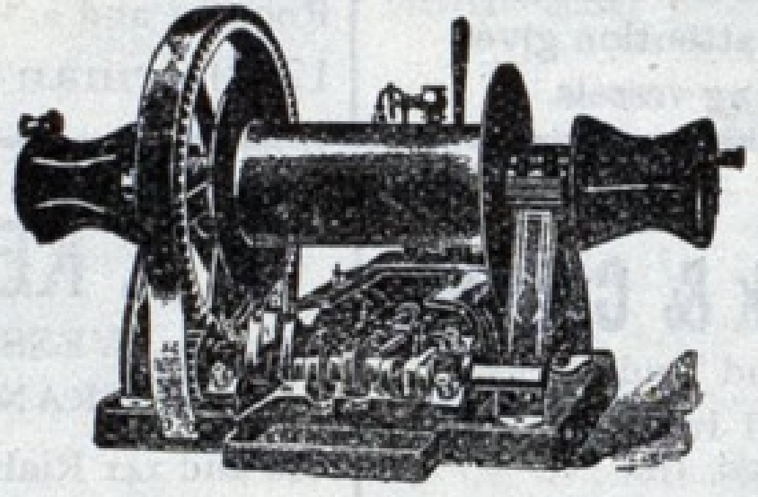

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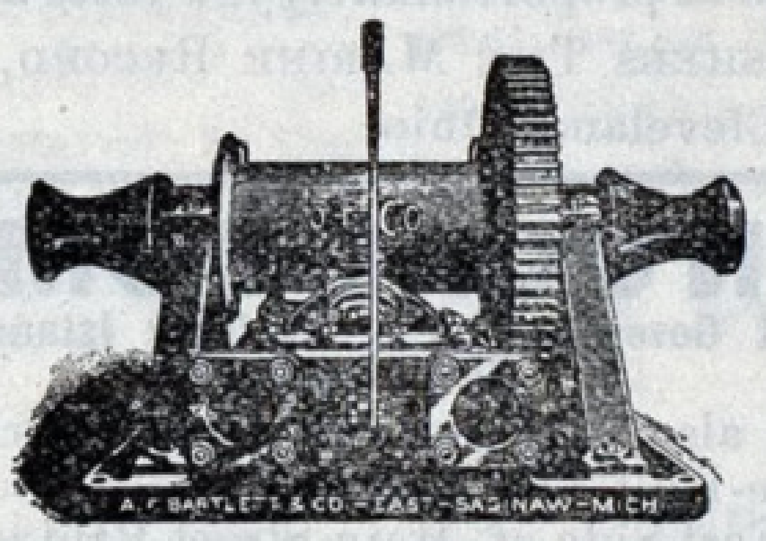

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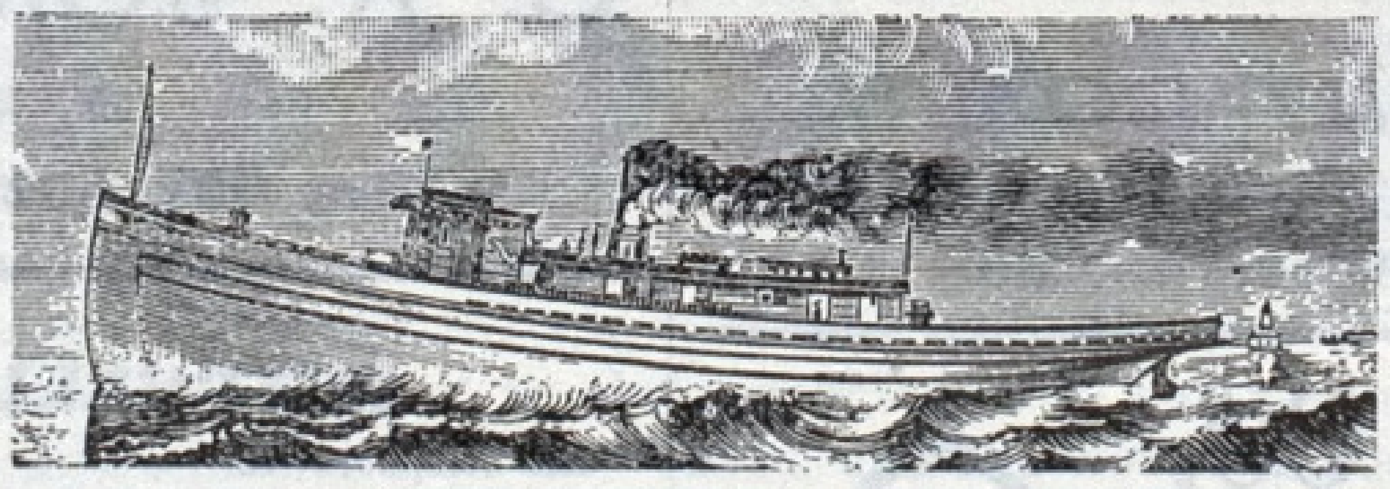

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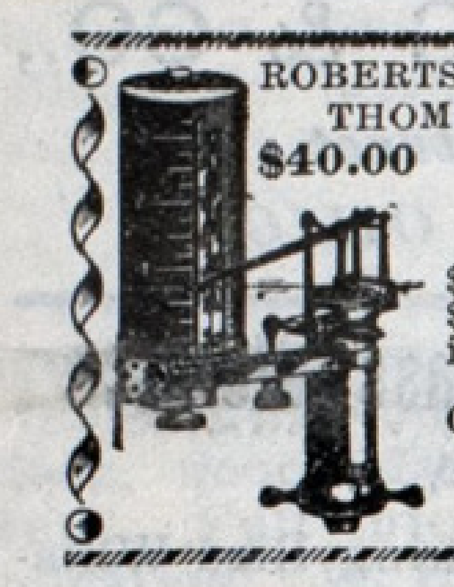

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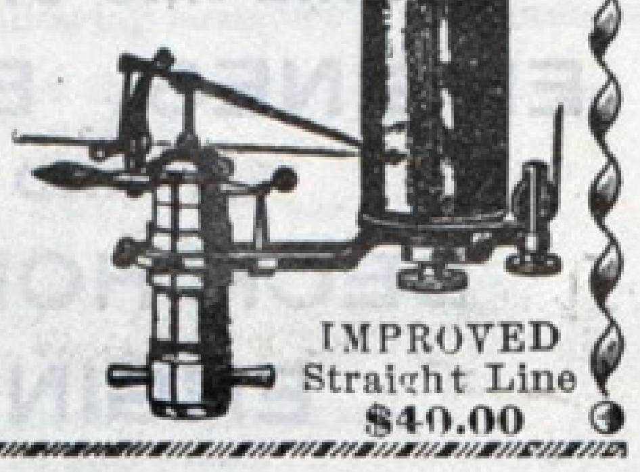

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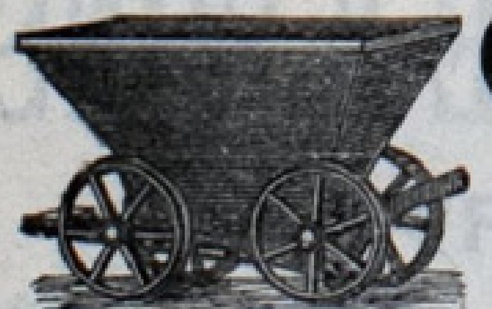

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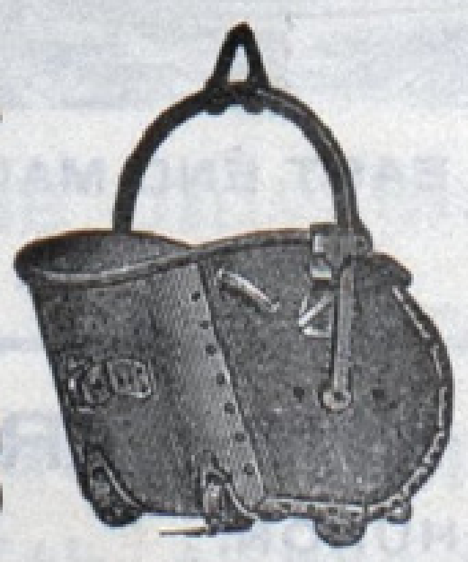

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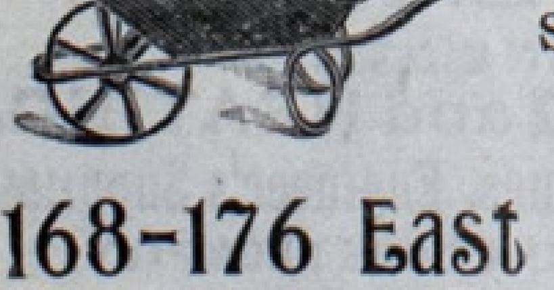

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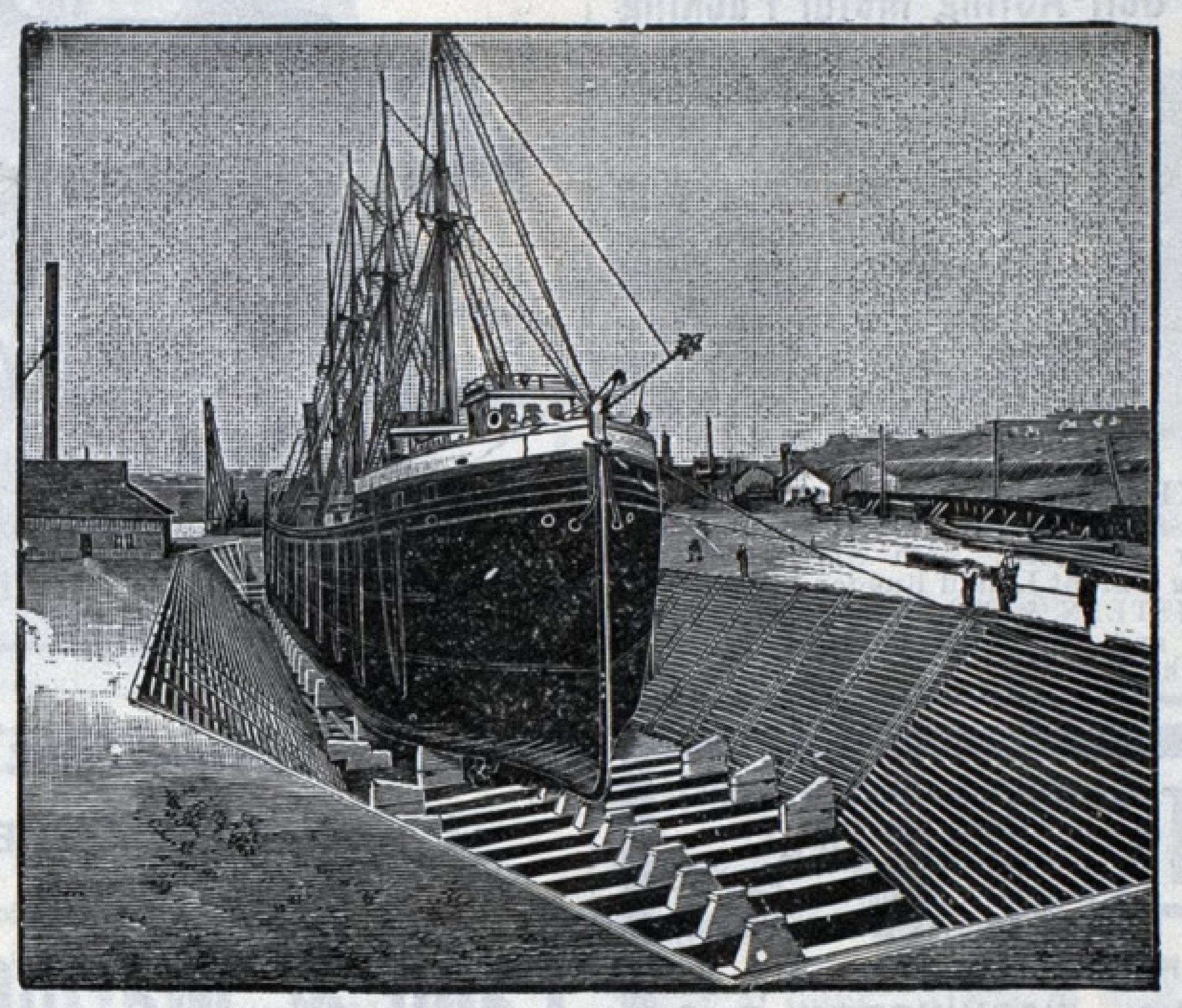

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